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ABSTRACT

This study compares open education groups and traditional education groups with respect to student attitudes toward high school; creative thinking of students; collaborative behavior among students; and student preferences for intellectual activities, activities involving change or sameness, and activities involving autonomy or dependence. Groups of first-year students from 20 different high schools in Victoria, Australia, were selected for comparison during one school year across three categories: open and traditional, metropolitan and rural location of groups, and school size. Differences over time were assessed by using an analysis of covariance technique, and differences between the two groups were assessed by t-tests. Research findings indicate in part that open groups were, toward the end of the school year, significantly more positive in their attitudes toward high school than were the traditional groups, and that open groups were also significantly more collaborative. Although the groups showed no significant difference with respect to preferred activities, the open groups did fall well below the performance levels of the traditional groups in creative thinking early in the school year. (Author/DN)

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THE FATE OF AN INNOVATION:
OPEN EDUCATION IN VICTORIAN HIGH SCHOOLS

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A THESIS SUBMITTED TO
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This thesis contains no material which has been accepted for the award of any other degree or diploma in any University, and to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except when due reference is made in the text of the thesis.

R.C. King

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ABSTRACT

This study aimed to compare so-called Open Education groups and so-called Traditional Education groups in respect of student attitudes to high school, creative thinking of students, collaborative behavior among students, and student preferences for intellectualised activities, activities involving change or sameness and activities involving autonomy or dependence.

Open Education was defined in terms of learning environments which stimulate diversity of activity and problems for students, interactive work situations, competent decision-making by students, self-reliance of students in collating and sorting information, and effective communication skills.

The research design allowed for data to be obtained from groups on two occasions, the differences between these groups being assessed by t-tests. Differences over time were assessed by using an analysis of covariance technique. Intact groups of first-year students from 20 different high schools in Victoria, Australia were selected for comparison across three categories; Open and Traditional, metropolitan and rural location of groups, and large and small size of schools in which groups occurred. In addition, case studies were carried out in order to account for possible mediating influences of organisational type and management practices and of innovative characteristics of Open Education upon any outcomes based on statistical comparisons. The time span of the study was a school year.

Open groups were significantly more positive in attitude to high

school towards the end of the school year than were Traditional groups. Open groups were also significantly more collaborative, a difference which became evident early in the school year. While the groups did not differ significantly in respect of preferred activities, significant differences did recur early in the school year in respect of creative thinking, the Open groups falling well below the performance levels of the Traditional groups. Because this difference had largely disappeared towards the end of the year due to the improvement of the Open groups, it is suggested that the students in Open groups suffered an initial bout of disorientation and disorganisation that could affect performance in certain school activities.

When a comparison of significantly different effects and non-significantly different effects is made, the proposition emerges that certain aspects of cognitive structure and collaborative behavior are volatile areas in which environmental influences can produce quite rapid change; whereas other aspects of personality structure such as preference for certain activities are more stable and less volatile.

Across the other categories, the only sustained significant difference occurred in respect of preference for change according to location of groups, Metropolitan groups displaying greater preference for change than did Rural groups.

From the case studies it was concluded that relatively minor shifts in organisational type and management system had occurred in the Open groups, although in some cases these were educationally significant enough to facilitate substantial changes in educational programs. The perceptions and expectations held by teachers and principals about organisation tended to be limited to the operation of schools and education departments, a factor which, to some extent, hampered the process of innovation. When considered as an innovation, Open Education faced better prospects of continuance where relative advantages in favor of it arose from crisis situations in which teachers were forced to look beyond prevailing roles and expectations. Finally, the tenets of Open Education were found to be complex from the point of view of innovation, and to be more successfully implemented when promoted as a complete package rather than as separate ideas.

CHAPTER 1

INTRODUCTION

1. The Open Education Movement

For more than a decade the movement known broadly as Open Education has been gaining impetus in the United Kingdom, the United States of America (Silberman, 1970) and, as this thesis will show, in Australia.

In principle, Open Education aims to combine teacher-centred education, child-centred education and materials-centred education to the extent that teacher and child can work together in deciding upon learning goals, activities and resource materials (Plowden, 1967). A typical claim is that Open Education is not so much a theory or system of education but a set of methods and ideas derived from practical experience (Walberg & Thomas, 1972). That Open Education lacks philosophical and scientific foundations is arguable however, for although it may have developed in many instances as a reaction to traditional curricula and methods, this very fact suggests that both philosophy (Why are we doing what we are doing?) and scientific method (How shall we define it and test its effectiveness?) are inherent if not always pursued rigorously. Some attention is given to an operational definition of Open Education in Chapter 4.

2. Open Education as an Innovation

From a research point of view there are special problems associated with the study of Open Education apart from the very basic one of arriving at an operational definition. The first relates to the recency of the movement. To the extent that Open Education is an innovation, effects on the students must be examined in the light of how complex it is to introduce, how readily communicated are its major premises, how divisible it is into component parts, how compatible are these premises with pre-existing attitudes, and what relative advantages are perceived by the teachers who introduce it. The second problem is that Open Education and Traditional Education are not mutually exclusive categories; the principles and practices of each may be seen in the other to a degree. The issues of complexity, compatibility, relative advantage, communicability and divisibility assume great importance when the conversion from one kind of education to another is a matter of degree, because a variety of distortions and interpretations can arise as innovatory ideas are adopted by individual teachers and diffused through the social network of the teaching profession. The third problem is that Open Education is an innovation of a particular kind; because it is largely a set of ideas and procedures it is difficult to measure. It has a low hardware component and a high attitudinal component, hence it is difficult both to market and to study as a package. These three problems taken together, are woven into the conceptual framework of the present research.

3. Special Features of Open Education in Victorian High Schools

While Victorian primary schools have developed patterns of Open Education in much the same way as their English and American counterparts, Victorian state high schools appear to have developed Open Education in a rather unique pattern. This uniqueness can be traced to four sources of pressure that tend to precipitate crises for which Open Education is a characteristic response.

In the first place, a sharp rise in births following the 1939-1945 War and a prolonged immigration program, have resulted in the number of high schools increasing from fewer than 50 in 1950 to more than 270 in 1970. As Borrie (1968) has observed, the generation of children born immediately after that War is now entering the child-bearing age and, unless there is a reduction in the birth rate accompanied by more restrictive immigration policies, pressure to build more high schools will continue. Secondly, economic conditions, combined with changing social attitudes concerning the value of higher level education have raised retention rates in the upper years of the high school program. Analysis of trends evident in 1966 suggests that nearly 20 per cent more of the 16 year old children will remain in attendance at secondary school by 1981.[1] Thirdly, the high schools have found their curricula placed under extreme pressure because of dramatic developments in the state of human knowledge. The question has arisen but not been resolved as to whether the amount of attention given to factual learning through traditional methods should be reduced in favor of more attention to the problems of learning how to learn. This problem, when combined with the preceding analysis, is likely to mean that demands will increase for curricula to have incorporated in them a greater variety than is presently available, as clients' needs become more varied. Finally, a somewhat different pressure on the curriculum designers has come from sources in the community, including some teachers, to use the school much more as a vehicle for changing society and for criticising and evaluating society's aims and practices. These sources of pressure tend to precipitate a number of crises.

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[1] Derived from Borrie (1968).

3.1 Alienation

Seeman (1959) refers to five aspects of alienation: powerlessness, normlessness, meaninglessness, isolation and self-estrangement. An examination of case studies filed over ten years by the Psychology and Guidance Branch of the Victorian Education Department[2] suggests the presence of all of the dimensions proposed by Seeman. The alienated student is one who may drop out of high school or, worse, may linger on at school through lack of job opportunity or through gross parental pressure (powerlessness). Whether dropout or malingerer, this student finds the traditional school environment too boring, too regimented and largely irrelevant (meaninglessness). He complains that the school seems more preoccupied with 'getting through a syllabus' than with making learning an interesting and worthwhile experience (normlessness). These case studies suggest that boys and girls are about equally affected. Even from case records of students not particularly at risk as dropouts and school refusals can be seen a fair proportion who constantly resent their educational experiences (isolation), who feel that they are wasting their time while collecting a ticket of work (self-estrangement) and who would prefer to see the system overthrown.

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[2] Based on 120 cases referred to the author for 'school refusal' in the period 1962-1971.

Of the curriculum of this kind of school Bernstein (1971) writes thus:

> "As the mystery ... (of the subject being studied) ... is revealed very late in the educational life - and then only to a select few who have shown signs of successful socialisation - then only the few experience in their bones the notion that knowledge is permeable, that its orderings are provisional, that the dialectic of knowledge is closure and openness. For the many, socialisation into knowledge is socialisation into order, the existing order, into the experience that the world's educational knowledge is impermeable. Do we have here another version of alienation?" (Bernstein, 1971:196).

The traditional curriculum and the organisational climate which surrounds it may, together, contribute to the social problems observable in the average high school.

3.2 Educational failure

Until recently, Victorian state high schools had placed heavy reliance on external annual examinations. An unpublished study by two Melbourne psychologists,[3] J.R. McLeod and C.C.B. Brown, suggests that the great bulk of educational failure in such a system is viewed more usefully as a function of that system rather than as a problem residing within the individual student. Fixed notions held by teachers and others about what constitutes 'proper' assessment tend to be tied to equally fixed notions about the distribution and inflexibility of intelligence in the school population, about expository teaching, about class size and about homogeneous ability grouping of students. McLeod and Brown speculate on the operation of a homeostatic mechanism in the traditional high school whereby the number of academic failures tends towards a stable 15 per cent of the school population regardless of educational improvements to eradicate so-called failure. This figure seems to reflect an organisational mentality about 'proper' pass rates, or a mentality in which a teacher feels that he is demonstrating professional good sense by maintaining a 'reasonable' ratio of failures to passes. The residual of this mentality, remaining in the minds of many teachers, students, parents and employers even though the public examination system is being progressively attenuated leads to confict. The high schools are now accorded much more freedom than before in evaluating their students, and much more freedom in articulating their own curricula. A crisis may arise from the fact that teachers have increasing freedom but not, in most cases, the mental set nor the training required to manufacture any great advantage from that freedom.

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[3] Details obtained in personal communication, December, 1970.

3.3 Student action

During the 1960's the mass media reported a rather dramatic rise, in many countries, of student groups assuming a mantle of dissent against bureaucratic and societal ills. The state high schools in Victoria, while not crippled by student action, have continued to be affected in certain ways, mainly through 'student revolt' and 'underground' activity including strikes and publications directed against the traditional authority of the school. Quite naturally, matters of authority, discipline, custodial responsibility and regimentation have become highly visible issues, and some Education Department administrators, in personal communication with the author, have expressed increasing concern that any further move away from the traditional organisation of education may aggravate social disorder and produce 'undesirable' behavior and attitudes in students.

3.4 Staffing and accommodation in high schools

Many Victorian state high schools still face problems of too few staff and too many students for too little space. Instances are reported of students being sent home during the normal school day because of such problems, and some schools resort to teaching on a shiftwork basis. Church halls and public buildings may serve as temporary school buildings for two or three years while the building program lags behind projected and actual demand. These are the more dramatic aspects of staffing and accommodation problems and, thankfully, are not universal. But the ratio of staff to students can be a problem in ways other than those suggested by examination of overall numbers. During the present research, some principals reported that, when staff numbers and accommodation are analysed on the basis of subjects offered, the effective ratios of staff to students and rooms to students worsen considerably. A further problem, closely associated with unsatisfactory ratios of staff and accommodation, is that of high turnover of staff. While it might be acknowledged that some turnover of staff in a school can be organisationally healthy, turnover in a high proportion of Victorian high schools has probably exceeded reasonable optima, especially in rural areas and in unpopular (i.e., working class) suburban areas.

4. The Significance of Alienation, Failure, Student Action and Staffing/Accommodation Problems for Open Education

In the previous section, particular issues have been selected and dealt with rather negatively. The purpose of this presentation relates to the question of Open Education as an innovation. An attempt will be made to show that, in Victorian state high schools, prevailing crises can be seen as exercising quite positive influences in the introduction of Open Education where that innovation might otherwise have failed to diffuse through the system because of lack of interest and low relative advantage or perceived pay-off. As it is, many schools are faced with seeking out alternative organisation structures and find the premises of Open Education immediately available; many teachers feel that their traditional roles as teachers are out of concert with the needs and demands of the student population and find these crises to be additional motivations in their search for roles that might offer greater job satisfaction.

5. The Basic Question

Open Education is perceived by most teachers and administrators as an innovation. (The relationship of modern Open Education in Victoria with the so-called Progressive Movement is not at issue here.) There is a reasonably extensive literature although much of it is impressionistic and lacking in rigor, a state of affairs probably attributable to relative recency. Many teachers and principals are working out their own alternatives to Traditional Education. Those whose efforts are labelled, or approximate what others feel should be labelled Open Education are asked: What are you doing differently from Traditional Education? and What are the effects of what you are doing?

The basic questions in this research are: What are the effects of Open Education on student attitudes and performance? Given the innovative nature of Open Education in the context of Victorian state high schools, what modifying influences on those effects are likely to arise from organisational constraints and problems in innovation?

6. A Time Perspective

This thesis, it is hoped, constitutes the first stage in a longitudinal study of various versions and effects of Open Education. Students, teachers and the school as an organisation will be studied over a period of at least six years, the time span encompassing the secondary school lives of an increasing number of students. A longitudinal study has the advantage of allowing time for the more stable aspects of behavior, cognition, organisation and the surrounding environment to change significantly if they are, indeed, likely to change. Yet it is felt that such information as becomes available in the more immediate future should be presented, with appropriate reservations, at an early date as an aid to ongoing evaluation. The first stage of the longitudinal study concentrates on one school year (1971) and those students who entered Form I (or seventh grade) in that year for the first time.

CHAPTER 2

REVIEW OF RESEARCH AND RELATED LITERATURE

Introduction

Two basic kinds of question are posed in this research, one concerning the effects of Open Education *per se* and one concerning the ways in which those effects might be modified by certain innovative characteristics and organisational features of Open Education. Essentially, there are two independent variables, Open Education *per se* and Open Education *qua* innovation.

The research and related literature referred to in this chapter are utilised in outlining what the term Open Education has come to mean to various theorists, practitioners and researchers, and in so doing, to suggest which effects, if any, of Open Education are worthy of consideration as dependent variables. Furthermore, consideration is given to those characteristics of innovation that might best indicate how such effects are modified in the case of Open Education.

The notion of 'openness' can be conceptualised as pervading five different levels of theory about human behavior. The first level is that of the politico-social system about which Popper (1962) has written. The community, society or state is treated as an entity or system capable of initiating, tolerating or barricading against influences from other parts or all of the environment in which it maintains its entity. Popper, of course, advocates an open society which has fluid relations between its own sub-sections and with the rest of the environment, unlike Plato who advocates more closed relations, boundaries and strata.

For many individuals interested in political systems, these polarised views represent different positions in respect of the ideologies of democracy and egalitarianism; and each of these ideologies has a firm place in the thinking and planning of many educationists.

The second level is that of the organisation. Katz & Kahn (1966), Burns & Stalker (1961) and McGregor (1960) have taken the organisation, its structures, processes or management styles as their foci of interest. Variations on the notions of 'openness' and 'closedness' can be seen in each of these works.

The third level is that of the group, and includes the problems of admission to membership and the sanctions and rewards that are applied to enable and ensure survival of the group qua group rather than as an unrelated collection of individuals. Ziller (1965) serves as a useful example of this position.

The fourth level is that of the personality, a position typified by Allport (1960) and dealing with the circumstances in which the personality of the individual and the social factors that contribute to the development and modification of personality come into confrontation with each other. This level incorporates many works which have utilised the notions of openness and closedness directly or indirectly through such concepts as extraversion and introversion, anxiety, neuroticism and adjustment.

The fifth level is that of the individual's perceptions of the world around him; the belief systems within which he perceives, determines and manifests his own actions and reacts to the actions of others. This level incorporates the attitude theorists such as Festinger (1957), Osgood & Tannenbaum (1955), Newcomb (1959) and Rokeach (1960), working variously on attitudes, opinions and beliefs.

While each of these levels of openness can be related to openness in the curriculum, this bridging analysis is intended primarily as a reference point against which various research efforts in Open Education can be located, and as a basis for developing a conceptual framework and explaining results of the present study. Hopefully, it will also serve as a constant reminder that the notion of openness as applied to education currently has better status as a conceptual tool than as a well integrated set of educational practices.

The mere labelling of certain processes, practices, attitudes, methods or whatever as Open Education (or even capitalising the words, as Rathbone (1970) points out) is to reify those processes, practices, attitudes and methods and thereby to distort them. To move a step further by labelling Open Education as an innovation may be to add to the distortion by creating even more of a thing. Yet the researcher quickly becomes acutely aware that to fail to apply a certain amount of labelling is to finish up without conceptual pegs upon which to hang his explanatory hats. Therefore, the present research utilises both labels - Open Education and innovation - with due apology to those practitioners who defy labels and with the constant plea that the reader maintains only a tenuous grip on both terms.

The remainder of this chapter is developed in three stages. The Victorian literature on recent curriculum changes in high schools and the Open Education literature emanating from elsewhere comprise the first two stages aimed at explicating Open Education per se. In the third stage the pathway is laid for Open Education to be considered as an innovation. When appropriate, the literature and research at each stage are related back to one or more of the five conceptual levels of openness.

1. Two Phases in the Development of Open Education in Victoria

During the decade beginning about 1962, two developmental phases became evident in the movement towards Open Education in Victorian high schools. The first phase can be traced over a period of six or seven years of heavy concentration on the fourth and fifth conceptual levels of openness already referred to; the level of the personality and the level of attitudes and beliefs. In this phase, curriculum changes, culminating in General Studies programs and consequent changes in methods, were achieved mainly by strategic alterations to the system of external (to the school) examinations. Although the term 'open' was not generally applied by teachers and administrators during this phase, it seems clear that many such individuals were espousing the view that the student should be enabled to enjoy his educational experiences rather than to hate them, and that he should be encouraged to develop his faculties of creativity and critical thinking rather than be allowed to develop as an uncritical mirror simply reflecting the gospel according to the fixed syllabus. Influential works by Neill (1962), Holt (1964), Mayer (1961), Hoffmann (1962) and Bernstein (1967) were included in the educational armories of many innovative teachers at the time.

In this atmosphere, in May, 1966, the Director of Secondary Education, R.A. Reed, sent a letter to schools and school organisations in which he proposed the establishment of a Curriculum Advisory Board (C.A.B.) " ... to examine the first four years of secondary education and to define the principles on which organisation, curriculum, procedure and assessment should be based."[1] He also stressed that when the time came for implementing those principles, individual schools should be asked to exercise their own choices rather than to follow an administrative fiat.

Reed's letter, while it did engender a great deal of interest, was not widely viewed at the time as the first shot in a battle that would result in profound changes in Victoria's state high school system. Many teachers and administrators were simply unable to envisage the full range of possible consequences, while others, cynical to the last, saw Reed's exercise either as a sop to dissatisfied teachers or as just another vain attempt by an enthusiastic administrator to change an unchangeable bureaucracy.[2]

However, Reed had done his homework well and persisted in the knowledge that he was supported by a sufficient number of people to lay in the foundations for change. The C.A.B. was duly established along representative lines to include the Departmental administration and specialist branches, independent schools, teacher organisations and universities. It is noteworthy that, up to this time, the great bulk of the secondary school curriculum had been articulated by the Victorian

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[1] Located in early documents of the Curriculum Advisory Board and cited in The Secondary Teacher, No. 157, 1970, p. 5.

[2] This evaluation is based on information obtained by the author, at that time a member of the Psychology and Guidance Branch of the Victorian Education Department.

Universities and Schools Examinations Board (V.U.S.E.B.). Notwithstanding this rather powerful organisation, the C.A.B., in 1967, proceeded to outline and circulate five principles about secondary education. Furthermore, it caused the establishment of five trial schools whose aim was to commit those principles to action (Hannan, 1970 a). The five principles were presented in somewhat challenging language thus:

> "(1) The first four years of secondary education (possibly the first five) should be considered years of general non-specialist education, open to everyone without discrimination of sex, background, aptitude or means.
>
> (2) Organization should try to ensure close teacher-student and student-student contact and be flexible enough to permit varied grouping and, if necessary, easy abandonment of traditional subject categories.
>
> (3) The basic curriculum offered, though it may be open to wide choice within it, should embrace at least the Arts, Social Sciences, Physical and Biological Sciences, Mathematics and Physical Education. It is not supposed, however, that all or any of these need be offered as separate "disciplines", nor indeed that there must be any fixed pattern within or between schools. (The Arts are taken to cover literature, the visual arts, music, film and drama).
>
> (4) There is no place for competitive assessment in Secondary School. Whatever assessment is done should be seen as a function of the essential communication between school and child and between school and parents.
>
> (5) Methods of teaching should encourage intellectual independence in students. Learning should be thought of as a co-operative not an authoritarian, situation."[3]

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[3] Derived from the Interim Reports, 1967, of the C.A.B., subsequently distributed to schools in 1969 in the document 'The work of the Curriculum Advisory Board', and reprinted in The Secondary Teacher, No. 157, 1970, p.5.

It would be naive to imagine that these principles and the trial schools arose simply from a blank sheet that had been covered with educational ideals. In fact there was considerable dissension in many high schools, of the kind adverted to in Chapter 1 above. A general review of The Secondary Teacher, the journal of the Victorian Secondary Teachers Association, for the years 1964-1971 leaves the reader with the impression that the most important thing was to find some point of entry by which the schools could be rendered more humane and more relevant in helping students to cope with the world of Toffler's Future Shock.

Reed's plan to reform the State's high schools provided that point of entry. He advocated:

> "1. Revision of the external examination system for the fifth and sixth years.
>
> 2. Statement of the purposes of secondary education and the principles governing the curriculum organization procedures and practices of the secondary school.
>
> 3. Request to the schools to use these principles, during 1969, as a basis for the preparation of an educational programme to be put into operation by stages, commencing in 1970.
>
> 4. Establishment of separate junior and senior high schools in the metropolitan area.
>
> 5. The formation of complexes, either in connexion with the junior-senior high schools, or by voluntary association of schools in country districts."[4]

Reed's plan could be backed by quite a strong argument. By tradition, high school education in Victoria had been selective and somewhat elitist in offering a competitive path towards certification for those students who aspired to university studies. But while aspects of the tradition remained - set syllabuses, set points of certification and competition for limited room at the top - secondary education in the high schools and technical schools had become universally accepted as the sine qua non for reasonable occupational opportunity.

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[4] From an address by Reed at the Seminar on the Secondary School Curriculum, conducted at Burwood Teachers College, Victoria, September 1-6, 1968. The text of Reed's address is reprinted in The Secondary Teacher, No. 157, 1970, pp. 8-11.

In short, virtually everyone wanted secondary education (mostly in high schools) but not all aspired to university studies. Even for those who did so aspire, serious questions were being asked as to whether the prevailing system was anywhere near adequate.

Any cynics who doubted Reed's determination to make changes of real educational consequence must have moved one step towards changing their minds had they seen or read about the performances of Reed and others at a Seminar on the Secondary School curriculum in September, 1968. Reed argued that secondary education must be seen as a phase of education in its own right and not simply as a preparation for tertiary education. The final report of the Seminar summarised the step that had been taken:

> "The abolition of the intermediate examination in 1967 intensified the need for a critical appraisal of the secondary school curriculum in Victoria. The Victorian Universities and Schools Examinations Board has since concentrated its attention on the fifth and sixth years while the Curriculum Advisory Board, established by the Director-General of Education and working mainly through its Steering Committee under the chairmanship of Mr. R.A. Reed, Director of Secondary Education, has been examining the first four years of secondary education.
>
> The seminar held at Burwood Teachers' College from September 1st-6th, 1968, was the fourth stage in a plan to involve all secondary schools and teachers in an

> examination of the curriculum for the first four years of secondary education. Prior to the Burwood Seminar discussions had taken place at three levels - school, area and regional. These discussions drew upon the papers on curriculum planning prepared by Mr. Reed and the interim reports of the Steering Committee of the Curriculum Advisory Board; visiting consultants were also involved. At each level, reports were prepared. The regional reports provided a valuable briefing for the seminar participants.
>
> The seminar itself which was attended by fifty-three teachers, seven group leaders and a considerable number of visitors and consultants was organized to provide a group of teachers with an opportunity to prepare a set of principles or objectives for secondary education which an individual school could use as a basis for developing a curriculum suited to its own needs."[5]

The essaying of principles and the development of associated practices in the schools themselves were accompanied by three other features which were followed subsequently by early research and evaluation. The first of these features was the commissioning of work by the C.A.B. from its supply of experts. One such work, which proved quite influential was a review and evaluation of streaming by Dow (1970).[6]

The second focused around the consulting activities of J.R. McLeod, who although his influence was profound, declined (or could not find time) to publish. McLeod, now Principal Psychologist in the Victorian Education Department, acted in a consultative capacity as an 'ideas man' for Reed and other members of the Department's administration, as well as for a large number of the schools engaged in implementing the new principles. McLeod's ongoing analyses of the social milieu and organisational structure of the schools were persistently founded in one question: How does the child learn?[7] McLeod's unswerving pursuit for answers to this question, along with his ability to translate the works of Piaget, Gagne, Chomsky, Vygotsky and others into practical consequences for the schools, assured his influence.

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[5] From the final report of the Seminar on the Secondary School Curriculum, September, 1968, reprinted in The Secondary Teacher, No. 157, 1970, p. 6.

[6] First issued in 1969.

The third feature was the part played by W. Hannan, at that time, editor of The Secondary Teacher, and himself an innovator at one of the trial schools. Driven by a desire to communicate possible alternatives for Traditional Education amongst teachers and, perhaps equally, by a due sense of history, Hannan editorialised, composed articles, compiled the rather disparate writings of his colleagues and generally appeared to exercise considerable influence as a member of the C.A.B.

The relevance of the authors already mentioned, and of personalities such as Reed, McLeod and Hannan to the subsequent changes from straightforward curriculum revision towards Open Education can be shown by tracing events in the schools themselves.

The pattern of events that actually emerged around the schools can be summarised as a movement from relatively Traditional Education towards relatively Open Education via the staging post of General Studies. Breaking down of the competitive external examination system left the way open for subsequent weakening of the boundaries surrounding conventional school subjects. In a typical case, one age/grade level in a school would pursue General Studies comprised of English, History, Geography and, occasionally Mathematics and Science, for the proportion of school time that these individual subjects would have occupied each week.

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[7] Personal communication, December, 1971, with McLeod and former colleagues of the author in the Psychology and Guidance Branch.

Hannan (1970 b) described the basic elements common to most of the General Studies programs thus:

> "(They) ... will include matters of school organisation, teaching methods and syllabus content. The main purposes of General Studies organization can be simply explained. One is to free blocks of time so that subject matter can be merged. The second is to concentrate the work of a few teachers, as a team, on a limited section of the school. Thus, if a school is divided into sections according to age levels, each year group will be given a group of teachers of varying background. 100 first year children, for example, would have five General Studies teachers. The teachers' backgrounds would include, ideally, the studies that make up General Studies, that is (in the average case) English, Social Sciences, Science and Mathematics. If there were enough teachers, Art would also be included. It is fairly common also not to include all of the Mathematics.
>
> In large schools, the age level group can be split in half, so that each year level may have two General Studies groups of about 100 each. The groups, of course, need not be based on age level, but include a range of ages from first to third or fourth years. Age level grouping is, however, by far the most common kind. The group of teachers is then usually left to arrange the time and activities of General Studies. The same group also handles a lot of the disciplinary and pastoral affairs of the level. Ideally, General Studies classes will be confined to a single area so that access to facilities, equipment and books for study can be constant." (Hannan, 1970b:29)

Common to these programs was the integration of subject matter around themes or topics based on a criterion of relevance to the world of the student.

The second phase in the development of Open Education in Victorian high schools became evident in the period 1970-1971 and carries through to the present time. In this phase, although attention is still paid to the fourth and fifth levels of openness (personality and cognitive development especially), much of the concentrated effort appears to have shifted towards those levels concerned with politico-social and organisational issues. Published works commonly referred to by teachers and administrators during this phase include James (1968), Kohl (1969), Goodman (1970 and 1971), Silberman (1970), Postman & Weingartner (1971) and, as a special rallying point, Illich (1971).[8]

Taken as a group, these authors have helped stimulate the development of a more positive and adventurous plateau than previously existed, on which educational change might be argued for the achievement of politico-social and organisational advantages.

Of the concept of openness, Hannan wrote in 1970 in the following terms:

> "First. The attitude taken to the subject matter should be open. There should be no series of conclusions presented to be learnt. The aim of the study should be to get children to ask questions, and to have them discuss the possible answers. Among the attitudes stressed in the class room, understanding of the human sources of ideas and tolerance of unfamiliar points of view should be paramount. Work, therefore, ought to be cast often in problem form and should tackle areas where there are no clear cut answers, and where prejudice and vested interest play a large role.

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[8] In 1972, Illich also lectured in Victoria as part of a lecture tour sponsored by the National Union of Australian University Students.

> Second. The topic should be open to various ways of working - a variety sufficient to offer something to every pupil. Such "openness" may consist of choices of areas within the topic or of choices as to the way work will be done (written, spoken, dramatized, demonstrated, etc.).
>
> The function of this variety is both to cater for differences of interest or ability and to compel some exercise of initiative. It is important that all of the various ways of working be treated as equally valid. Teachers are often accustomed to regard written responses as more substantial than others, and reading as a more important source of ideas than others. For General Studies work, one must get used to the idea that other activities may rank with reading and writing.
>
> Consider further that even within written work there may be various responses, so that an excursion planned with scientific discoveries in mind may yield more poems than reports; that what was to be an essay may make a better play.
>
> Plainly, there is nothing here to surprise a mixed group of subject teachers. Each one, however, will have to make some adaptions to his habits. The Science teacher may not be used to getting poetry in his lab. The English teacher may be stronger on feelings than facts. Yet, both are being asked not only to accept various ways of expressing ideas, but to so structure their work that these ways are kept open to their students. General Studies makes large demands on a teachers knowledge and on his capacity to co-operate with other teachers." (Hannan, 1970b:31)

However, according to White & Wynn[9] the teacher was being asked more than this:

> "The decision to be made is whether education is to introduce children to the intellectual culture, or whether it is simply to be a sophisticated training. In fact there is no real choice; if education is to be genuinely intellectual, it can only be the former. To do otherwise is to assist the destruction and degeneration of the intellectual culture, and hence ultimately the skills and knowledge behind the

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[9] The document 'An approach to General Studies' by D.C. White and Eva Wynn was originally issued by the Curriculum and Research Branch of the Victorian Education Department and is reprinted in The Secondary Teacher, No. 157, 1970, pp. 31-33.

> technology of modern life. If the schools convert themselves, in ways appropriate to them, into institutions concerned with the development of students as members of the intellectual culture, it does not mean that they will not also serve a useful function in terms of training in those skills believed necessary in modern work. In fact, students who receive this non-functional, intellectual type of education will be even better equipped to meet the particular demands of a changing society, but they will do so from a position of independence." (White & Wynn, 1970:32)

The shift to a politico-social level of openness from the first to the second of these quotations is obvious enough.

Other writers went on to deal with more specific issues. Hannan, Hannan & Dow (1970) produced a paper for the C.A.B. entitled 'Literature in the secondary school curriculum' in which matters of actual implementation of the new programs were detailed.[10] Freeman (1970) and White (1970) engaged in similar exercises in the areas of Mathematics and Science respectively.[11]

Furthermore, many of the teachers and principals who had chosen or been chosen to implement new programs in trial schools attempted to describe and evaluate their efforts. One notable feature of virtually all of the published reports was the preparedness of writers to make forthright comment without harboring any rosy illusions about apparent successes or failures but, equally, without any apparent diminution in enthusiasm.

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[10] This paper was issued by the C.A.B. in 1969 and subsequently reprinted in The Secondary Teacher, No. 157, 1970, pp. 37-43, and elsewhere.

[11] Both of these articles appear in The Secondary Teacher, No. 157, 1970. Freeman's paper was originally presented at a Victorian Secondary Teachers Association Curriculum Seminar, Monash University, 1969. White's article was originally prepared for the C.A.B.

The evaluations themselves were basically descriptive and contained little or no attempt to assess cognitive gains or losses, or to move beyond an impressionistic view of behavioral and attitudinal changes resulting (presumably) from the innovative programs. However, it would be uncharitable to criticise such evaluations for this seeming failure, because so much time had been taken up with developing ideologies, planning programs and preparing for their implementation that evaluation in these formative years had remained largely in the realm of professional judgment.[12] Most of the reports could be classified as traps and hints for new players in a new educational game where the role of the teacher was significantly changed. Timetabling procedures and problems, strategies for opening out classroom space and incorporating corridors, techniques for team teaching, and listings of new resource materials, all received close attention.

Barlow (1970), Golding (1970), Hopkins (1970), Laird (1970), Simpson (1970), Turner, Oglesby & Lindsay (1971), Hill (1972) and Golding & Poad (1973) can be cited as useful examples of General Studies approaches that appeared to pave the way for the development of more radical alternatives to Traditional Education, but with increasing emphasis at the level of openness in organisational terms.

Somewhat more abstract than the evaluations of specific programs, have emerged a few general evaluation studies also aimed at the organisational level. This approach is exemplified by

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[12] See Appendix 1, a paper dealing with problems of evaluation in alternative programs. During discussion of this paper, several teachers suggested that evaluation should actually be resisted.

Whykes (1971)[13] who attempts to draw together some of the literature and practices relevant to flexible organisation, Reus-Smit (1971) who attempts a sociological analysis of the open school, and Dow (1971)[14] who writes of (what she calls) teacher-proof resources. Dow's warning about resource packages which enable the teacher to shift his educational responsibilities is worthy of special note:

> "I have seen the most superb open classrooms, architecturally speaking, from which all dialogue about the stuff of learning is totally absent. I have seen the most insidious form of streaming in the most doctrinaire, unstreamed schools and classes. In the difficult new situation the teacher needs help in quickly finding appropriate resources, and he must be given it; but, in the process, both he and his pupils must retain control so that they genuinely interact with each other and take into account the supreme importance of allowing for spontaneity at the beginning, the middle and end of all learning experiences. Packages can, but don't necessarily, militate against this." (Dow, 1971:16)

An even newer literature base is now emerging in Victoria, tending to embrace several conceptual levels of openness at once, and clearly creating pressure to force the General Studies approach delineated above in the first phase, further along the path to Open Education and community schooling. Included here are the works of Mahar (1972), White (1972), Cohen (1973), Freeman (1973) and Tickell (1973). Perhaps it is not surprising that, having arrived at a practical plateau of General Studies curricula within a relatively short time, writers in Victoria are now shifting their attention to several levels of openness. Three reasons can be proposed.

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[13] Whykes originally wrote the document 'Flexible Organisations' as a report to the Churchill Trust in 1970. It was reprinted as an article in The Secondary Teacher, No. 167, 1971.

[14] Dow's article, 'Teacher-proof resources', appeared almost simultaneously in The Secondary Teacher, No. 170, 1971, and Issues in Technical Education, Vol. 2, No. 3, 1971.

In the first place, many local writers and teachers appear to have gained confidence following the major initial break with Traditional Education. The feeling seems to be: We carried our principles this far into practice; perhaps we can carry them on to the next stage as well. Secondly, with a few of the local battles won,[15] more attention is being paid to developments and writings in other countries. Thirdly, academics and professional researchers (both of which groups could sometimes be accused of wanting to study only proven, successful innovations) have entered the field and broadened the perspectives of the Open Education movement.

The matter of how successful the pressures towards Open Education and community schooling will be is also considered in this research.

2. Research Perspectives on Open Education

2.1 The problem of research boundaries

There appear to be two basic problems awaiting the researcher who chooses to examine this field. The first is that the boundaries of the field of Open Education are vague and disputatious; hence the researcher is liable to criticism for having started or stopped in the wrong place because there is no consensus as to whether the most relevant research is that concerned with method, architecture and design, social organisation or other aspects of human behavior. The second problem involves the question of what is acceptable as research. Is a politico-social treatise that advocates Open Education from an observational base of social commentary and reform, acceptable as research? Is the published descriptive material of a teacher who claims to have innovated Open Education with his Grade 4 students, acceptable as research? If these answers are affirmative, what status attaches to such material as research and what credibility as evidence? If the answers are negative, how much valid use can be made of reputable marginal research in the absence of reputable focal research?

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[15] For example, abandonment of formal, public examinations at the end of fourth year of high school, and introduction of experimental schools or groups.

Several different approaches are possible each providing a different set of boundaries within which Open Education might be defined. Five of the six approaches mentioned below (that is, excluding the first) appear to define Open Education largely in terms of reaction against presumably unpopular aspects of Traditional Education. Note that these approaches are not intended to bear a direct relationship with the five levels of openness already outlined above, but are meant to reflect the clustering that appears to have occurred in reality.

If one adopts a rather historical and philosophical approach, Open Education is seen readily as a modern term which implies certain moral and philosophical components of the relationship between teachers and children, jointly engaged from opposite sides in the transmission of culture from one generation to another and in the transmission of skills considered relevant to the maintenance, growth or change of the prevailing social system (including the economic sub-system). Locke, Rousseau and Dewey are a few, among many who have dealt with these relationships over a period of centuries. Within the time perspective of the 20th century itself, Dewey is frequently considered along with Montessori and Neill as part of a 'progressive' movement in education about which the historian Selleck (1972) writes so eloquently. If there is a persistent theme throughout the writings of these people, it is the essential humanism that should be encouraged in educational environments during the growth of the child.

The difference between this approach and others is that the latter tend to arise as a reaction against what is now accepted as Traditional Education; that is, mass education in which the numbers are so great that schools as institutions have tended to regiment students, to concentrate on teaching, and to adopt the so-called dehumanising and alienating aspects of work organisations engaged in economic mass production.

Take Illich (1971) and the advocates of deschooling as a second approach. In this case, the basic concern appears to be that social institutions have tended to work against the interests and well-being of individuals; hence some process of institutional inversion is required to restore the balance. Illich sees a breaking down of the school as a fundamental strategy in a plan to render all social institutions more humane. This approach might be termed a social-philosophical approach.

As a third approach, take the perspective of proponents of 'open' relationships between teachers and students, based on mutual trust, and focusing on teaching styles and methods that are felt to be in accord with this pedagogical viewpoint. The most fully reported and observed cases have occurred in British primary schools, including schemes such as Integrated Day programs and British Infant School programs (e.g., Plowden, 1967; Moran, 1971; Walberg & Thomas, 1972; Weber, 1971).

A fourth approach is the perspective of open space school design and architecture, in which the size of the instructional space can be varied widely by the re-location of partition walls, furniture and technological aids. Authors attracted to this perspective demonstrate a firm reaction against the organising of students into cells in which they can be taught and in which rows of desks are supposed to aid the efficiency of teaching by providing the basis for an almost military style of organisation. Goss (1965), Eberle (1969) and Bumbarger (1972) associate openness with a generous physical environment. With somewhat less altruism however, Macbeth (1971) argues simply that the open space approach derives from the instructional implications of team teaching.

A fifth approach relates to so-called individualised instruction as conceptualised by Gibbons (1970) and others in terms of educating with due allowance for individual differences both in capacity to learn and in prevailing state of knowledge. Such instruction can be seen as a reaction against massive uniformity in teaching practices in use at the beginning of the present century; a reaction that was largely responsible for the development of tests for measuring human abilities and intellect (Guilford, 1967). An important element of the movement towards tests and instruction programs, culminating in the behaviorist approach to learning (Skinner, 1938) and in the growth of organisations such as Science Research Associates, is that the traditional school, in its pursuit of uniformity and stress upon the similarities in people, engages in a destructive denial of the vast differences in motivation, skills and intellect evident in the herded masses of students. The reaction in this approach is against stress being laid on the similarities between people and against failure to acknowledge the differences between people.

A sixth approach can be summarised in the term social organisation, which, to some extent, incorporates the other perspectives by allowing reference to a total educational environment ranging from basic ideas about the processes of learning, through to the distribution of decision-making rights and the bases for exercising power. The present study approximates such an approach.

With regard to the problem of what is acceptable as research, A Bibliography of Open Education by Barth & Rathbone (1971) serves as a starting point. These authors classify various books and articles into a number of sections including descriptions of practice, theory, history, the physical and affective environments, strategies for implementation, and research. There are 221 entries in these sections of the Bibliography, 21 others in a section on films and a further 21 in a section on periodicals, making a total of 265 entries. Only 5 entries in the whole work are classified under Research; namely, Gardner & Cass (1965), Chittenden (finally published as Bussis & Chittenden, 1970), Gardner (1966), Giacquinta (1968) and Plowden (1967). Perhaps the most surprising feature of this apparent paucity of research is that Barth & Rathbone use the term Open Education in such a broad sense that a potentially vast research field is brought within view. They refer to a general approach to teaching and learning, to the child's right and competence to make important educational decisions, to the teacher as a facilitator of learning rather than as a transmitter of knowledge, to vertical or 'family' grouping, and to flexibility of time, administration and space in an "environment rich in manipulative materials, abundant alternatives and choice for students" (Barth & Rathbone, 1971 : Introduction). When the field is so vast and the research coverage so small, one is forced to ask whether the problem is really one of an absence of research or one in which the proponents and students of Open Education have simply failed to notice the relevance of research work that has not been written with Open Education specifically in mind. Whichever is the case, it should be said, in fairness, that research which isolates Open Education as its focus is approaching the take-off point in the early 1970's and that the next few years may see sufficient consensus growing as to what Open Education involves as to enable the incorporation of research studies with marginal status currently.

These studies might hail from areas such as classroom interaction, exemplified in Smith & Geoffrey (1968); the affective environment, exemplified in Stern (1970); small group behavior, in Berne (1963); group dynamics, in Thelen (1954) and Cartwright & Zander (1953); job satisfaction, in Coulter (1971); personality, in Maslow (1970);[16] role behavior, in Biddle & Thomas (1966); and the science (and other) curriculum studies, in Wheeler (1967), to name but a few.

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[16] First published in 1954.

This kind of diversification can be expected as more features of Open Education are identified as potentially valuable independent variables the study of which may offer clues for future educational decision-making. Up to the present, most of the directly relevant studies refer either to aspects of open method, open space or open climate or to some combination or variation of these aspects. Despite the warning by Angus (1973) that many of the current research procedures involve taking certain practices and clothing them in a dubious theoretical framework, what we are seeing at the moment is probably the formation of a new educational and politico-social ideology.

Before a general analysis of research is introduced, one study is worthy of mention as a benchmark in its own right. This is the study, Open Education and the Teacher by Rathbone (1970). Rathbone considers a number of questions which include the following: What is Open Education? What are its distinctive practices and organisational features? and, What are its implicit ideologies and assumptions about learning, knowledge and schooling? Yet, to the researcher in Open Education, the answers which Rathbone provides to these questions may not be as important as his coverage of literature and people. No attempt is made, in the present study, to repeat Rathbone's effort to locate all of the key people and works in Great Britain and North America; suffice to say that Rathbone's coverage provides an interesting backdrop, based on the primary and infant schools, for an Australian study based on secondary schools operating under different pressures.

The detailed analysis of research which follows is classified into studies based on physical environment, organisational climate, teachers and methods, operational definitions and community schooling. Whichever category is being considered it will be noted that virtually all of the studies reported have a 'one off' flavor about them because the dependent or criterion variables are relatively unique and because the research sites are not replicable. The criterion variables refer to administrative strategies, hardware requirements, students' problems, or, perhaps too infrequently, cognitive performance.

2.2 Open Education based on the physical environment

Much of the research into Open Education has been directed towards space or physical planning. Smith (1971) relates open space design to administrative style and space utilization, concluding that different groups of teachers will employ different administrative strategies which may have serious implications for the extent to which instructional areas are used as planned by the architects. An associated type of study is that presented by Burr (1971) who considers the matching of open areas with appropriate furniture to enable and encourage adequate use of available space. Primary attention will be given in future, Burr suggests, to designing for the learning process rather than for discipline or maintenance functions. Acoustical, noise absorbing furniture, movable library stacks and electric carpets to provide multiple sources of power supply, will all aid flexibility and mobility. From the standpoint of long term success potential for open plan environments, such developments require urgent attention, although it is interesting to note that Kyzar (1971) considers the noise problems of open plan rooms to be solved already.

Deibel (1971) endeavours to answer the question of how well the open space schools meet the demands placed upon them and concludes that achievement of (what he calls) the central aim of individualised instruction is indeed constrained by limited software materials and insufficient satellite spaces for small groups and individuals. Nevertheless, Deibel places a human factor (limited thinking by school staffs) at the top of his list of constraints.

McCallum (1971) makes a useful contribution to certain aspects of educational decision-making in her examination of children's problems in open space and conventional elementary schools. McCallum sets out to compare teachers' and children's perceptions of children's problems, using an analysis of variance technique and taking useful steps to approximate randomness in her treatment groups. Among the findings two are of interest here. In the first place, whether a school is an open-space school using team-teaching or a conventional space school appears to bear no relation to the kinds of problems experienced by children, nor to the depth or duration of a problem, nor to the source of help for a problem. Secondly, there appears to be no relation between the type of school in which teachers are working and the kinds of problems teachers identify in their pupils. Two questions come to mind immediately:

(1) Could these findings apply at high school level where teacher-student relations change in character somewhat?

(2) To what extent are McCallum's results a function of the degree of commitment of teachers to the innovation?

Killough (1971), also following an open space approach, examines the effects of a non-graded elementary program conducted in an open space school, on cognitive achievement. This study, which combines open space and open method approaches to some extent, led to useful findings. Students in the open space non-graded program evidenced higher achievement in most cognitive areas and at a faster rate than other students. Furthermore, these cognitive gains were still evident two years into the conventional American junior high school program.

The work of Leuders-Salmon (1972) also commands attention. She attempts a comparative study of the impact of self-contained classrooms and open space, team teaching schools on classroom activity. Her prediction is clear; open space rooms will be more 'active'. And her definition of 'active' incorporates down-to-earth features; in particular, the amount of movement not specifically directed by teachers, the proportion of time children spend waiting, listening or being passive (a negative feature), the proportion of time children spend in large groups (also negative), and the proportion of time spent in educational games and co-operative work. Among her findings, Leuders-Salmon lists several worthy of note here. Open space rooms were twice as active; more active classes occurred with a more informal control orientation; organisational problems forced large teams to break into small teams; teams of four teachers had more active classes than teams of two; and structure, as well as ideology, played a major part on the child's environment in the elementary school.

The study by Townsend (1971) should be viewed as a useful work not only because it examines more than one dimension but also because one of its findings contrasts with those of related studies. Townsend compares open space, departmental and self-contained schools with regard to teacher style, pupil attitude and pupil achievement. He notes that little evaluation has been forthcoming on the influence of these structures on the learning environment. Admittedly, the study is weakened considerably by the sampling procedures (only one school is taken as representative of each of the three organisational types); nevertheless the basic approach might be investigated further with real profit. Townsend concludes that children in self-contained and departmentalised schools show better achievement growth in more subject areas than do children in open space schools. Of course, such a conclusion may be confounded by the greater relevance of the achievement tests to traditional approaches and by the lack of longitudinal data that might account for an hypothesis concerning temporary deterioration of achievement during adjustment to open space operations. The present study takes cognisance of these issues.

Characteristic of much of the research on open space rooms is its triviality. From a single 20-item Likert scale checklist sent to teachers and students, Ledbetter (1969) concludes that open spaces are liked, that carpet is the best single feature of open teaching spaces, that the comfortable atmosphere of the open area is pleasing to the participants, that students enjoy the individual and group work, and that student storage space is something of a problem. Yet the express aims of the study are to analyse open teaching spaces in ten selected school facilities, to trace the development of these facilities through the U.S.A., to describe the design and the instructional programs, to discover teacher and student reactions to the facilities, and to analyse the strengths and weaknesses of open plan schools.

Kleparchuk (1969) displays similar triviality. He attempts to study the supervisory services necessary to improve instruction in open space schools. Methodologically, the Chi-square design based on means from a five-point scale of attitudes about supervisory services (those means being ranked for relative desirability) does not seem particularly strong. A relatively innocuous question, pursued with a relatively inadequate technique, adds little more to the state of knowledge than would mere description. Kleparchuk's findings reflect these weaknesses. For example, his research claims to demonstrate that principals should maintain good staff relations and should create a climate for discussion, that teachers should help with planning and policy, that teachers need assistance in experimenting with new materials and approaches, and that lay participation, help for weaker teachers and help for teacher teams to plan lessons are all required urgently. Such research could hardly be accused of driving the study of Open Education ahead with alacrity.

Brunetti's assertion still remains to be challenged:

> "It is unlikely that the school building itself has any direct measurable effect on whether children learn to read better or teachers are more inspiring; rather it will permit or restrict certain functions that may or may not be related to the performance measures. If functions related to performance have not changed - if there is no change in staff organization and relations, no change in program planning and co-ordination, no change in curriculum, no change in student/teacher relations, no change in instructional strategies - the residual effect of space upon student and teacher performance will very likely be small." (Brunetti, 1971:8)

Clearly, there is a dearth of research that has reached any finality on the issue of educational space because that factor has not been isolated in the better studies, while in the weaker studies, poor designs confound the conclusions. One must then ask whether space, per se, is a useful focus of study at present for those interested in Open Education.

2.3 Open Education based on organisational climate

The work of Halpin & Croft (1963) has served as a base for much of this research. These writers use a Likert-type scale for measuring organisational climate in schools, from which two groups of factors derive. The first group are listed as open, autonomous, controlled, familiar, paternal and closed; while the second group comprise authenticity, satisfaction and leadership initiative.

An investigation by Appleberry & Hoy (1969) centres on openness of organisational climate in elementary schools and its relation to the pupil control ideology of professional personnel. Appleberry & Hoy identified 15 schools with relatively open climates and 15 schools with relatively closed climates and conclude that the former manifest a good deal more humanism in dealing with students than do the latter. However, information about openness and about pupil control ideology is derived entirely from principals and teachers. Neither students nor independent observers are consulted about the veracity of claims made by staff.

Again, the study from this group, most relevant to Open Education, examines more than just climate. This is the study by Weiss (1971) in which students' feelings about school and student achievement are related to openness of classroom climate, openness of teacher personality and openness of student personality. While the results obtained by Weiss are not surprising they are, nevertheless, of value. In the first place, students low in dogmatism felt more positive about school and attained higher grades than students high in dogmatism. Secondly, student dogmatism was lower in open classrooms than in closed classrooms. Thirdly, student dogmatism was lower in classes where the teacher was high in dogmatism. Fourthly, students achieved higher grades and felt more positive about school in open than in closed classrooms. Fifthly, students in a closed classroom felt more positive about low dogmatic teachers while, in an open class, students felt more positive about high dogmatic teachers. Finally, student achievement and positive attitudes were positively correlated.

To the practitioner and the parent, studies of the Weiss type offer a glimmer of hope, not only about Open Education, but about the worth of research into Open Education. The reason for this is that Weiss is one of the few who have tackled the problem of cognitive gains. The fact of apparent contradictions between the findings of Weiss and those of Townsend are understandable given the state of the art in the practice of Open Education, but the leads provided for other researchers are quite important.

2.4 Open Education based on teachers and their methods

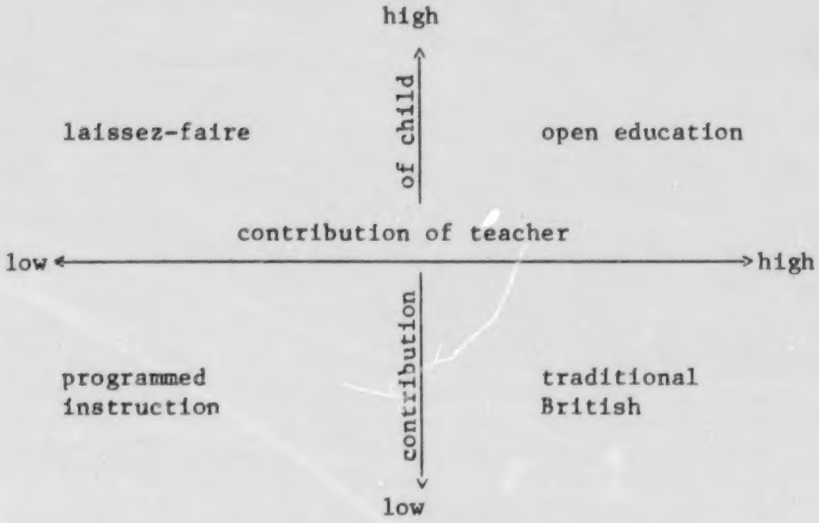
Whenever teachers and their methods are discussed in relation to Open Education, argument is likely to arise around the question of the extent and quality of decision-making on the part of students.

This alliance is typified in the work of Innes (1971) in which environmental forces in open and closed settings are studied. The open classroom is defined in terms of a period of the classroom day in which choice about academic work is offered to students. A closed classroom is one in which students are required to complete a specific assignment. Essentially openness and closedness are conceptualised in terms of level of teacher intervention and its reciprocal, decision-making power of students.

In similar vein, but at an abstract level only, Bussis & Chittenden (1970) conceptualise classroom environments along the dimensions of teacher contribution and child contribution. This scheme allows the allocation of a given classroom to one of four quadrants, represented diagramatically in Figure 2.1.

FIGURE 2.1

CLASSIFICATION OF TEACHING APPROACHES ACCORDING TO CONTRIBUTIONS OF TEACHER AND CHILD[17]


high
laissez-faire
of child
open education
contribution of teacher
low
high
contribution
programmed instruction
traditional British
low

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[17] Reproduced from Bussis & Chittenden (1970:23).

Resnick (1972) has moved further than the abstract level in her attempt to describe systematically the behavior of the teacher in an informal or open classroom. Resnick not only establishes categories for observation of teacher behavior but reports a study based on those categories. Two interesting conclusions should give cause for thought amongst teachers:

> "Since there are no formal means of assuring that the child works on tasks suited to his current level of development in any particular area, the child's acquisition of basic skills in an informal environment depends on a combination of two factors:
>
> (a) the extent to which the child is able to extract from a complex and 'distracting' environment those tasks that optimally 'stretch' his current repertoire of skills and concepts - i.e. the extent to which he can 'programme' his own learning; and
>
> (b) the extent to which the teacher, on the basis of informal observation and evaluation and her own knowledge of the subject matter, can guide the child to appropriate tasks." (Resnick, 1972:109)

Barth (1970) has also concentrated upon the teachers and particularly on the assumptions which they hold about learning and knowledge. Barth's contention is that strong agreement with his 29 assumptions will indicate that a teacher is most likely to be an open educator, or is potentially so.

More than a year after he had assembled these assumptions Barth (1971:Ftnt 3) claimed that none of the proponents of Open Education, tested in the interim, disagreed with any of his assumptions. We are not told whether the results are any different for the proponents of Traditional Education or of other alternatives to Traditional Education.

Perhaps the greatest difficulty arising from works that have attempted to conceptualise Open Education in terms of a balanced relationship between teacher and child relates to vagueness and even confused and contradictory thinking. Angus (1973) notes three examples, the first contained in a description of the laissez-faire classroom by Bussis & Chittenden:

> " ... the adult plays a very supportive but entirely non-directive role, the children having great freedom which occasionally erupts into chaos. The adult is rated as low in contribution for several reasons, one being passive acceptance of the curriculum or some set of "accepted" practices and procedures.
>
> ... The pre-school teacher here is likely to be a rather bland individual who does not come through strongly as a person ...
>
> This quadrant would also contain rooms characterized by an extreme "hands off" or laissez-faire attitude in which the adult generally attempts to avoid expressing personal preference or direct suggestion." (Bussis & Chittenden 1970:22)

The second example can be found in Walberg & Thomas (1972), where the child is described as a " ... significant decision-maker in determining the direction, scope, means and pace of his education ...", while at the same time it is asserted that the " ... teacher and child, in complementary roles, should together fashion the child's school experience ..." (Walberg & Thomas 1972:198).

The third example appears in Rathbone (1971), where the open educator is described by his functions:

> "His function is not to present answers nor indeed always to present well articulated questions; his function is to offer, instead, opportunities within which the child will generate his own questions and from which he will derive his own satisfactory answers. The teacher prepares and presents places where learning is likely to occur;

> he himself acts as a resource within those many and overlapping learning environments offered to the child" (Rathbone, 1971:107).
>
> "When he does decide to make an instructional intervention, the teacher ..." (Rathbone, 1971:107); and
>
> "The open education teacher must intervene differently each time; not only must he be able to apply different strategies to different children performing different tasks during the same days but indeed, he may be required to be both highly directive and thoroughly permissive towards the same child with respect to two quite different areas of learning the child has entered" (Rathbone, 1971:108).

The flaw common to these three examples is the author's acceptance or ignorance of a substantial shady area between decision-making by the child and decision-making by the teacher. Presumably, a reader is supposed to know about and understand the subtleties of this area, but, from the point of view of the practising teacher who wants to know what he and the child should do differently from before, it is the shady area that requires the fullest explication. The theorists who stress the child-teacher relationship in Open Education but who fail in this explication are, to some extent, drawing a shroud of mystique on a field that needs plenty of light.

The apparent lack of clarity that pervades the teacher/method area, especially where it deals with decision-making, may be due in part to an associated lack of clarity as to what pay-off is aimed at when a student is accorded decision-making rights about his educational program. Furthermore, the openness encompassed by these rights has a somewhat hollow ring about it because the teacher is clearly retaining the right to abrogate the student's decision-making rights when he feels so inclined. Among other things, perhaps this suggests lack of understanding of the dimensions of freedom and control.

An interesting and productive variation on the teacher/method studies is that by Gibbons (1970) which concentrates on the extent of individualised instruction associated with particular curriculum programs. Gibbons classifies programs on three levels; the first being the level of instruction (whether individualised or by class), the second being that of the decision-making pattern in the classroom (divided into active, responsive and permissive), and the third being that of the nature of the interaction between student and teacher (either direct interaction or indirect interaction). Moving from this basic classification, Gibbons develops profiles of individualisation which, he suggests, have the advantages of requiring the examination of each of 15 elements of a program, of distinguishing the unique features of a program, and of facilitating comparison of different programs (Gibbons, 1970:11). The manner in which Gibbons uses his profiles is quite illuminating. Linear programming, the Oakleaf Project, the Winnetka Plan, the Leicestershire schools and Summerhill are compared and contrasted by way of practical example.

Also of considerable value is the work of Gardner & Cass (1965). Along with Plowden (1967) this work stands fairly close to the beginnings of the modern Open Education movement. Concentrating on the role of the teacher in British infant and nursery schools, Gardner & Cass offer a plain, practical analysis of good teaching, an analysis that is warming not least because it so lacks pretension of any kind. They examine teaching in terms of three major groupings; teacher behavior that shows concern with providing intellectual stimulus and imparting knowledge, teacher behavior that shows concern with fostering and encouraging good social attitudes (although what is meant by 'good' is taken somewhat for granted), and teacher behavior that establishes an environment favorable to education and to the social, emotional and intellectual welfare of the child.

If a researcher was to be forced into choosing one work that contained a comprehensive analysis of the teacher/method area, and many other areas besides, he would find difficulty in ignoring Plowden (1967). This study of children and their primary schools stresses five straightforward but profoundly significant recommendations that appear to have served as pivotal points in the development of Open Education in the primary schools in recent years. It recommends in the first place, that individual learning should be facilitated by mixing individual, group and class work. Secondly, it suggests that the class should remain the basic unit for examination, especially for young children, but that the child should have access to more than one teacher. Thirdly, it advocates that children should be grouped vertically or in 'family' groupings rather than as age/grade groups. Fourthly, it warns that streaming should be avoided. And, finally, it calls for much greater flexibility both in the length of the school day and in the spacing of the school year. All of these points appear to escape major criticism by such writers as Peters (1969).

Two other kinds of teacher/method studies should be adverted to. The first is the change agent or helper study such as that by Johnson & Page (1972) which involved practical considerations of helping traditional teachers to plan and implement student-centred classrooms, with particular reference to management of the transition from Traditional to Open. By using a variety of workshop techniques significant changes were manifested in the behavior of teachers and students, in the direction of behavior identified as typical of student-centred classrooms. The second is concerned with the teacher's effectiveness in evaluation. Marram (1972), for example, has noted an association between teaming of teachers previously isolated from each other in performing traditional teaching tasks, and the soundness and importance of their evaluations for the task performer.

In terms of the five levels of openness, most of the teacher/method studies are difficult to place because the reasons for transferring decision-making power to students are largely unclear. Within the one study, these reasons might vary from politico-social considerations of individual human rights of choice, through organisational considerations regarding a wider scope for the role of the teacher and through considerations about the development of the child's personality, to considerations of cognitive functioning instanced through the exercising of a student's facility for analysis and critical thought.

2.5 The search for operational definitions

Several studies focus on detailed descriptions of Open Education and on identification of the essential (if not sufficient) variables that, together, amount to Open Education.

Of the more general studies, Plowden (1967) and Rathbone (1970) stand out as major contributions, and their work has already been referred to earlier in this Chapter. Of the operationalising studies, three good examples can be noted.

Stewart & Angus (1971) try to characterise classroom behavior according to its degree of openness. They use a Classroom Description Questionnaire comprised of eight dimensions, high scores along which indicate openness of teaching. The dimensions are teacher flexibility, classroom informality, student independence, individualisation of instruction, materials awareness, text independence, inter-teacher co-operation and use of resources outside the school. The findings and implications of the study, summarised by Angus (1973) are worthy of detailed report:

> "Several important findings emerged from the validation of the scale which bear on the definition of open education. First, there was an overall correlation between open classroom practices and open school design. Thus the dichotomizing of the independent variable of the study into "open practices" and "practices in open space schools" may be somewhat arbitrary. Secondly, when each scale was considered separately, on some subscales traditionally designed schools were more open in approach than open space schools. Thirdly, factor analysis revealed that the subscales were interdependent. A teacher activity factor accounted for most variation. Teachers who loaded high on this factor tended to have frequent contact with their colleagues and other adults in their professional capacity and not to be bound to any routine in the management of their classroom. Informal student/teacher relations characterized the second factor while teacher utilization of technology characterized the third. These three factors accounted for 69 per cent of the total variation.
>
> The implications from these findings for the development of scales to measure the openness of education are several fold: open building and open practices though they may have sprung from different beginnings are now in varying degrees related phenomena; scales to measure the concept of open education will need to be multivariate in nature if they are to describe differences among schools or classrooms; and, subscales of instruments which are devised to measure openness of education are likely to be statistically dependent though logically the constructs operationalized in the subscales may appear relatively independent." (Angus, 1973:12)

Another attempt to operationalise Open Education is that of Walberg & Thomas (1972). Following largely on the work of Bussis & Chittenden (1970), general areas are identified from which eight themes emerge. The resulting Observation Rating Scale and parallel Teacher Questionnaire comprise 50 items, allocated to themes in proportion to the amount of attention given to those themes by the original writers and in terms of a " ... criterion of possible observability" (Walberg & Thomas, 1972:199). The particular themes are provisioning for learning (25 items), humaneness (4 items), diagnosis of learning events (4 items), instruction, guidance and extension of learning (5 items), evaluation of diagnostic information (5 items), seeking opportunities for professional growth (2 items), self-perception of teacher (1 item), and assumptions about children and the learning process (4 items). The canonical correlation between the questionnaire and observation is significant at the .001 level.

Traub, Weiss, Fisher & Musella (1972) provide a third example, similar to Stewart & Angus in that Open Education is described through observable characteristics of school programs. Ten 'topics' are derived; setting instructional objectives, materials and activities, the physical environment, structure for decision-making, time scheduling, individualisation of instruction, composition of classes, role of the teacher, student evaluation, and student control.

Perhaps the basic problem of validity with most of the studies in this area is that data are obtained exclusively from the teachers who are reporting their own behavior. Whether or not students and independent observers would agree with such teacher-reported behavior remains a vexing question.

2.6 Community schools: a logical outcome of developments in Open Education?

Two obvious boundaries have surrounded the discussion so far. The first is that the vast bulk of literature and research currently associated with Open Education is oriented towards the infant and primary schools. The second is a logical consequence of this fact; that Open Education has been considered largely in terms of the custodial and socialising aspects of the relations between adults and children.

Once the age barrier and the barrier of custodial responsibility (and, indeed, legal liability) are lowered, the concepts, practices and behaviors that comprise Open Education assume new dimensions in which educational institutions need no longer be seen as physical environments which end at the school gate. The whole community and its citizens may become integral parts of the educational environment. Furthermore, the logical extension of vertical or 'family' groupings in educational institutions is to introduce the adult, as participant or student, who is interested in continuing his own education.

As Bailey (1971) observes, there is need to employ the best brains in the community to the task of bringing the city to the classroom and exploiting the city as a classroom when appropriate. One implication of this rationale is that teaching can no longer be left entirely to the professionals. Boulding (1971) and Wood (1971) offer similar suggestions which, in Melbourne, Australia, Tickell (1973) and Freeman (1973) are already carrying into practice. Another implication is that the boundaries of the school as a formal institution may be altered and rendered more flexible; permanently in some respects and pro tem in others.

More so than has been the case previously, the developments in community schooling suggest that all five levels of openness will be encompassed in the one strategy. At the politico-social level, the total environment of the child, and not simply the school, becomes a basis for relatively formal education of the child. At the organisational level, the conventional boundaries of the formal school are at least loosened. At the group level, admission becomes more open and less formal, with sanctions and rewards generating from within the educational group rather than being imposed by the professional teachers. At the level of personality development, the learner is clearly engaged in an exercise in adjustment between his own perceived needs and those of his fellows. And at the level of attitudes, beliefs and cognition, the individual is endeavouring to maximise his development by constant interchange with a wide variety of ideas and attitude postures.

3. A Review of Research into Innovation as it Relates to Open Education

3.1 Introduction

> "An educational innovation has a natural history and, in a sense, a life cycle. The full account of the life cycle of an innovation is the story of its invention, development and promotion, adoption, diffusion, and demise, along with an account of the problems encountered and solutions developed in introducing and maintaining the innovation in specific settings, and the unanticipated consequences growing out of its use." (Carlson, 1965 a:4)

One preliminary note is necessary concerning definitions. Detailed definitions of terms will be encountered at various points throughout this text but some rough distinctions ought to be made at the outset as to what is meant by 'change', 'innovation' and 'system'. Miles (1964) suggests that the word 'change' is a rather undefined, primitive term implying nothing more than a noticeable alteration in something between one time and another time. The word 'innovation' however, while it is a species of the genus 'change', can be thought of as a " ... deliberate, novel, specific change, which is thought to be more efficacious (than what previously applied) in accomplishing the goals of a system" (Miles, 1964:14). In turn, a 'system' can be defined broadly in Daniel Griffith's terms as a bounded collection of interdependent parts devoted to the accomplishment of goals and with the parts maintained in a steady state in relation to each other.

In their own approach to educational innovation, Miles and his co-authors think of 'system' in the sense of social systems (made up of persons, groups or organisations) devoted to the achievement of educational goals.

Miles (1964:15-18) also classifies educational innovations as dealing with one or other aspect of a social system; boundary maintenance operations, size and territoriality, physical facilities, time scheduling, goals, procedures, role definition, normative beliefs and sentiments, structure, socialisation methods, and linkage with other systems. In order to reflect the integrity of Open Education in Victorian high schools, the present study, at one time or another, straddles most of Miles' aspects of the social system.

The earlier sections of this chapter were directed to the elaboration of Open Education per se to assist in answering the question:

What is meant by Open Education? The present section shifts attention to Open Education qua innovation as a basis for showing how intended outcomes of Open Education, however defined, might be modified or distorted by the very innovative nature of Open Education. The question here is: What aspects of innovation theory and research should be taken into account when explaining the modifications and distortions surrounding the implementation of an Open Education program?

The studies considered in this section are used as a range from which particular concepts might be chosen for the conceptual framework outlined in Chapter 3.

3.2 Innovation in politico-social terms

Research into educational innovation is pervaded by a bewildering array of publications. In terms of sheer volume, studies based on the work of Paul Mort were probably dominant until the mid-1950's, having commenced in the late-1930's and consolidating soon after with the publication of American Schools in Transition (Mort & Cornell, 1941).

Mort's basic concern was adaptability, or the " ... capacity of an institution to respond to its role in society and to new insights concerning its techniques of operation" (Vincent, 1961). By the time of Mort's death in the early 1960's well over 200 studies had emanated from this tradition. The earlier among these studies suggested that it would take up to 50 years for an educational innovation to become widely diffused, while the more recent studies suggested that this time lag between initiation and widespread implementation of an innovation had reduced considerably by the 1960's. Some evidence is presented in later studies (e.g., Marsh & Gortner, 1963) to support the view that the basic factor in the recent acceleration of change rates is the portion of gross national product devoted to curricular and related innovations. To the extent that this cause-effect chain is realistic for the United States of America there seems little reason to doubt that the same arguments could be applied to other comparable national or economic entities or systems.

Studies by Gittell (1966) and Clark (1965) also provide concepts that may be valuable for an understanding of educational innovation at a national or societal level, each invoking the concept of power elites in slightly different ways.[18]

Gittell (1966) advocates a shift from studies that merely identify power holders towards studies that describe the pattern of power distribution. She proposes the use of four models. The first model is that where a single elite dominates undifferentiated masses, concentrating power in its own hands. In a technological society the total amount of power available is likely to increase so much that a single elite will find it difficult to retain absolute control. Because new elites will arise a new distribution of power will occur. Gittell argues that change is unlikely in these conditions; however, it does seem possible that she has overlooked the likelihood of a single elite generating change on its own initiative. The second model involves challenge to the power of a primary elite by a lesser elite, manifesting threats to any privileged positions. Moderate and gradual change is likely in this case. The third model views power as diffusing among many competing but relatively equal elites. Because there is great potential for shifting in primary power positions from one elite to another, steady change is likely. The fourth model envisages a vertical elite structure with two or more strata of competing elites. A more general model, it is likely to encompass the other models.

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[18] These writers appear to use the word 'change' in the same sense that Miles uses the word 'innovation'.

Gittell's models can be related to the first section of this chapter, concerned with developments in Victorian high schools. Prior to 1964, conditions approximated the first model, with a single (bureaucratic) elite maintaining power and stability by virtue of regulations and tradition. The second model applies after 1964, but with an interesting variation. The direct challenge to powerful elites (such as the Teachers Tribunal which largely determined employment conditions in the Education Department and general staffing conditions in schools) derived from lesser elites such as the Victorian Secondary Teachers Association. However, to some extent, the power bases which these lesser elites were able to establish appeared to be a function of deliberate construction by individuals (such as Reed) who already held positions of power. The third model appears to be relevant from about 1970.

The study by Clark (1965) incorporates a sensitive analysis of a power elite in the form of the United States of America's Physical Sciences Study Committee (P.S.S.C.). A system of voluntary relations among and between local, state and national groups was developed to assist with curriculum revision following the success of the Russian Sputnik program. Clark refers to the need for a theory of confederative organisation or organisational alliance. Such a theory allows for the uniting of effort without the usual bureaucratic authority of a formal hierarchy and its associated grades of employee status. Clark suggests that in a typical bureaucracy, authority and supervision are delegated internally or by legal contract; however, within inter-organisation patterns of the P.S.S.C. kind where the leverage attaching to position is reduced, authority and supervision arise by specific agreement or by arrangement with those holding particular responsibilities and competences. Clark traces four components of the P.S.S.C. pattern of influence. A Federal agency and national private committee had provided a status and a (potential) financial basis for involving various independent groups and organisations that quickly moved towards alliance. Commercial organisations manufactured necessary materials for sale in the education system presumably with half an eye to profit. Universities and colleges used the materials in training teachers and, in turn, local authorities adopted the materials and allowed their teachers to re-shape courses as required.

As Clark points out, this chain had the prestige of expertise, while the voluntary nature of organisational involvement led to an advantage of speedy diffusion. Clark does, however, also admit a dysfunction of inequality in which the rich and progressive districts showed great interest while backward districts moved slowly, a difficulty that might be overcome through the use of incentives.

3.3 Innovation in terms of organisations and groups

A study similar in some ways to that of Gittell is Archer & Vaughan (1968) which uses the group as a basis for conceptualising educational innovation in terms of conflict. In their view educational innovation will occur when a particular group successfully asserts itself against the already existing dominant group.

Proceeding from a related perspective, Andrews & Greenfield (1966) suggest that the concept of homeostasis might be extended beyond the static, steady state hypothesis to include a situation in which an organisation is characterised by a constant rate of change or even an accelerating rate. To incorporate this position, Andrews & Greenfield suggest that the culture of the organisation must be considered. To the extent that culture can be viewed as a mode of adaptation by the organisation to its environment, this approach seems sensible.

Gallaher (1965) takes an anthropological approach to the same notion of culture as an adaptive mechanism. Here the socio-cultural system is seen alternately as tension-producing and tension-reducing.

Bennis (1965) is another writer who seeks to account for and manage change by using models of organisation beyond the more conventional bureaucratic types. Bennis describes an organic-adaptive organisation consisting mainly of problem-solving groups of specialists from a wide range of disciplines, who work together for short periods and whose partnerships dissolve with completion of the task or upon solving the appointed problem. Such an organisation would allow more freedom and more opportunities for work to be based on intrinsic motivation, presumably with positive consequences.

Foster (1968) offers a similar solution for problems arising in the change process. He notes the development of two parallel positions; the systematic, organised change model and the process-involved complex.

Works by Guba, Clark, Brickell and Bennis have proved useful in the systematic, structural approach, but the process-involved approach, suggests Foster, is likely to be more applicable and facilitating in a school system that is open in character.

From amongst the management theorists who have attacked the same or similar problems in the more general setting of work organisations, Burns & Stalker and McGregor can be taken as representative of a large number, including the socio-technical systems theorists such as Emery, Trist and Murray from Britain's Tavistock Institute of Human Relations.[19] While for many purposes these writers are classified as human relations theorists, they might well occupy a clear place in educational innovation research.

Burns & Stalker (1961) refer to mechanistic and organic forms of management for organisations. A mechanistic system, appropriate to stable conditions is characterised by such matters as task specialisation and the abstract nature of tasks; by precisely defined rights, obligations and methods and the attachment of rights to functional positions; by hierarchical structuring of control, authority and communication; by vertical interactions between members; and by attachment of greater prestige to local than to cosmopolitan knowledge, experience and skill. The organic system, appropriate to changing circumstances, presumably including those conditions where an innovation is likely to give rise to unanticipated consequences and new problems, is characterised by special knowledge being contributed to a recognised common and realistic task; by continual re-definition of individual tasks; by generalised acceptance of responsibility; by a network structure of control, authority and communication; by lateral interaction between members, without reference to seniority; and by attachment of greater prestige to a cosmopolitan orientation in respect of knowledge and expertise.

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[19] A critique of this group of studies is given by Brown (1967).

McGregor (1960) takes as his basic concern the strategies which managements in industrial organisations might employ to motivate and harness human resources more effectively. Although he does not write with innovation specifically in mind, the link between his work and that of Burns & Stalker is quite evident. McGregor suggests that traditional management propositions often lead to depleted productivity. These propositions (Theory X) tend to assume that man is indolent and will not work unless forced, that he is indifferent to organisational needs, that he is resistant to change and is not very bright. An alternative set of management propositions (Theory Y) is likely to be more productive because it does not assume that man is comprised, inherently, of these negative traits. In Theory Y, man is assumed to have the capacity for assuming responsibility except where organisational experiences have rendered him passive or resistant. The task of management, then, is to arrange organisational conditions and methods so that people can achieve their own goals while directing their own efforts towards organisational goals.

Miles (1965) also refers to innovation in organisations, suggesting that an organisation with a high probability of success in innovating is likely to have clear, achievable and appropriate goals; it will develop distortion-free communication vertically, horizontally and across its boundaries; and it will seek optimal power equalisation, encouraging collaboration upwards, downwards and sideways. Unfortunately, educational organisations display some special properties that may militate against such qualities. Ambiguous goals, input variability and invisibility of role performance are typical of the difficulties that must be overcome for successful innovation to occur.

Although further reference will be made in Chapter 3 to management-oriented studies in organisational innovation it should be noted here that most pay scant attention to the possibility of a conventional bureaucracy acting in a highly innovative way. Indeed, there are reasonable grounds for suggesting that these studies represent a reaction to a dysfunctional aspect of many present day bureaucracies; namely, that in providing stable services such bureaucracies are losing another very important quality of adaptability.

A remaining factor, especially relevant to the management aspect of educational innovation, concerns the historical pre-conditions pervading an organisation engaged in innovation. Greiner (1967), referring to a practical example, attempts to show that the presence or absence of certain early events and the extent to which they are allowed for, may make the difference between a mediocre and a highly successful innovation effort.

3.4 Innovation in terms of the individual

Most, if not all of the studies which embrace concepts relating the individual to educational innovation, focus on attitudes in some way.

Insko (1967) has attempted to summarise the contributions of various theorists to the study of attitudes. The concepts contained in these theories have not been widely applied to educational innovation but the potential relevance to studies of administrators, teachers, students and parents is clear.

Several attitude theories have examined attitude change as an equilibrium phenomenon. Osgood & Tannenbaum (1955) refer to a principle of congruity, which holds that " ... when two attitude objects of differing evaluation are linked with an assertion there is a tendency for the evaluation of each object to shift towards a point of equilibrium or congruity." (Osgood & Tannenbaum, 1955:42-55). Rokeach (1960) referring to belief congruence, Heider (1958) and Newcomb (1959) to balance theories, Rosenberg & Abelson (1960) to consistency, and Festinger (1957) to cognitive dissonance, have all examined attitudes and, in some cases, the changing of behavior, in terms of equilibrium. Sarnoff (1962) applies psychoanalytic theory to attitude change, endeavouring to show a link between motives as tension producers, and action as a means of tension reduction. In its own way, this is also an equilibrium theory.

Somewhat different is McGuire's (1962 and 1964) inoculation theory which tackles the problem of inducing resistance to change by the presentation of weakened or refuted counter-arguments. Owen (1970) and Eichholz (1963) also utilise resistance theory; Eichholz in particular, proposing a theory about the process of teacher rejection of change through the components of awareness, disinterest, denial, trial and rejection.

Finally, there exists at least one theoretical position which views the individual from both resistance and acceptance perspectives. This is exemplified in Barbichon (1968) who stresses the relevance of social images, a term which appears to have a close parallel in the notion of stereotypes. Such images or models of change are said to be dangerous and thwarting of change when adhered to so strictly by individuals that the means to change become limited, inflexible and possibly more important to individuals than are the goals which the change is intended to achieve.

3.5 Tool concepts for the study of innovation

The preceding sections relate innovation to general conceptual levels that might be chosen to give a particular focus of analysis. In addition, there are four aspects of innovation frequently used as tool concepts in describing and explaining change processes regardless of the focus of analysis: adoption, strategies, leadership and change agency. Indeed, these tool concepts are so much a part of the language of innovation research that their value and meaning in the area are sometimes taken for granted. Close examination however, reveals that they should not be taken for granted; therefore brief consideration is given to them to indicate the kinds of limitations that must be kept in mind whenever they are used.

3.5.1 Adoption

Many of the studies referred to in the foregoing discussion, and others besides, focus on rates and characteristics of adoption. Two major works, Rogers (1962) and Rogers & Shoemaker (1971) summarise much of the recent work in this area, with fairly heavy concentration on rural sociology and the analysis of agricultural innovations. In the earlier of these works, Rogers outlined five attributes of innovations (as perceived by users) that were likely to facilitate successful adoption: relative advantage, compatibility, complexity, divisibility and communicability.[20] In the latter work, the term 'trialability' is substituted for divisibility and the term 'observability' is substituted for communicability, but the sense is identical.

Perhaps the main doubt raised in respect of the concept of adoption concerns the use of data based on the reported behavior of adopters (Fullan, 1972) rather than on actual adoption and on the consequences of an innovation.

Studies by Havens (1965), suggesting that the individual's definition of the adoption situation will affect the nature of his acceptance, and by Pareek & Chattopadhyay (1966), referring to multi-practice adoption behavior, provide additional support for Fullan's doubts about the value of reported adoption as a variable.

The danger is that despite claims of marked change there is likely to be found, in fact, a marked lack of change and, indeed, strong teacher persistence with pre-innovation roles (Fullan, 1972) along with lack of difference in the way students perceive what is happening (Owen, 1970). Indeed, Fullan suggests that such a finding should not cause surprise, because in most educational innovations the person who decides upon adoption is a different person from the one who must actually do the adopting and make use of the innovation; in some ways a different state of affairs from that which applies in other areas such as agricultural innovation.

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[20] Chapter 4, Section 3 below includes definitions of these terms.

Having taken Fullan's criticism into account along with the quite proper criticisms by Gross, Giacquinta & Bernstein (1971:20-22), the present study is located more nearly in the mould of those studies that examine actual use and assessable consequences through observation by people other than the adopters. Such studies include Goodlad, Klein _et al_ (1970), Gros _et al_ (1971), Martin & Harrison (1972), Sarason (1971), and Smith & Keith (1971).

3.5.2 Strategies

Two works provide useful contributions to this area.[21] Chin & Benne (1969) classify strategies for implementing change into three categories; the empirical-rational approach in which it is assumed that logical explanations will suffice to enable effective change; the power-coercive approach in which individuals with greater power will direct and influence those with less power; and the normative-re-educative approach in which programs will aim to change basic values, attitudes and role relationships. Parallels can be noted between these categories and Etzioni's (1961) utilitarian, coercive and normative compliance models.

The second contribution is that of Havelock (1970) who suggests that innovation can be carried out in six stages: (1) building a relationship, (2) diagnosis, (3) acquiring relevant resources, (4) choosing the solution, (5) gaining acceptance, and (6) stabilising the innovation and generating self-renewal. Fullan (1972), however, is critical of the failure of this strategy to work directly for the improvement of any generalised problem-solving capacity in the system that employs it.

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[21] Guba (1967) and Maguire (1970) provide useful summaries of the area, and deal with many studies that could not be considered in the space available here.

3.5.3 Leadership

Studies that direct attention to the place of the school principal and superintendent in educational innovation are not difficult to find. Carlson's (1965 a) study attempts to relate the rate of adoption (or reported adoption, as Fullan reminds us) of six educational innovations[22] in the states of Pennsylvania and West Virginia to a number of characteristics of superintendents. Carlson suggests, rather tentatively, that non-adopting superintendents differ from their more innovative counterparts by:

(1) having less formal education;
(2) receiving fewer friendship choices;
(3) knowing less well and being known less well by fewer of their peers;
(4) participating in fewer professional meetings;
(5) interacting less often with their peers;
(6) being sought less often for advice;
(7) being rated lower on professionalism;
(8) holding less prestigious superintendencies;
(9) perceiving less support from their school boards; and
(10) relying more on local sources of information.

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[22] The innovations studied were modern mathematics, programmed instruction, team teaching, foreign language laboratories, foreign language instruction in elementary schools, and accelerated programs in secondary schools.

Apart from Carlson's work, used here to give a general picture of the concept of leadership in educational innovation, a review of other studies, for example, those by Hughes (1968), Holdaway & Seger (1968) and Fiedler (1967), can lead to a feeling of limited value in this line of study. Many studies appear to concentrate on principals and superintendents because such people are fairly researchable. Less cynically, it might be suggested that many of the educational innovation/leadership studies prove to be of limited value because they are not 'coalface' studies; that is, they ignore the behavior, skills and attitudes that must become evident in the teachers who actually implement innovations and the students whose duty it is to benefit from them.

For these reasons, the present study concentrates mainly on students and teachers, with the behavior and characteristics of principals and administrators referred to only in that framework.

3.5.4 Change agents

The notion of change agent is well known in the area of farming practices; he is usually the extension officer or agent who acts as a professionally skilled and innovative outsider made available to the individual farmer either as a government employee or as a member of a private research, development and dissemination group.

Carlson (1965 b) notes the absence of a similar role for educational practices and attributes slowness of change in education largely to this absence. And although he nominates the school superintendent to act in this role, Carlson also notes a problem inherent in such a choice; namely, that the superintendent, as a central part of the unit he is attempting to change (unlike the agricultural extension agent) may not prescribe changes in his own practices.

At least one attempt to introduce a change agent (titled Resource Colleague) into schools was severely affected by a related problem. Hancock (1972) notes the contradiction in educational change agents being asked to act as peers of teachers for whom they take responsibility as trainers. The trainer-to-trainee relationship is not a peer relationship but a superior-to-inferior relationship.

Geis (1968) advocates the introduction of a special innovative agent who can be located, full time, at the site of an innovation; who can specify and evaluate the effectiveness of instructional goals, who sees himself as something of a behavioral engineer, and who is capable of disseminating materials, methods and research findings. Such an individual could work in a way similar to a subject co-ordinator but would not see the traditional classroom as the limiting factor in his efforts. He would not merely suggest changes, but would actually work on and with the innovation, and would plan his role deliberately so that his allegiances would be split between the ongoing needs of the organisation and the task of implementing the innovation.

For Jones (1969) the confusions and failures that abound with respect to agents in planned organisational change derive from insufficient attention being given to the tasks of isolation, identification and definition of agents in terms of what such people should actually do. Jones distinguishes between a change agent (who helps in achieving improved organisational performance), a change catalyst (who causes or speeds up or slows down change), and a pacemaker (who provides a source of energy from outside the organisation in order to carry out some vital function) (Jones, 1969:15-17).

In the present study, senior administrators, principals, teachers and special service personnel may be identified in one or other of Jones' terms.

4. Summary

Most of the research and other literature, whether concerned with the developments in Open Education in Victoria or overseas, or with the innovative characteristics of Open Education can be related to the notion of openness at one or more of five conceptual levels. These levels are the politico-social, the organisational, the group, the personality and the attitude and belief levels, together providing useful reference points for the remainder of the study.

Indeed, failure to acknowledge that openness is referred to in these various ways by different writers and practitioners may engender unnecessary confusion, misunderstanding and apprehension.

CHAPTER 3

A CONCEPTUAL FRAMEWORK

1. The Research Strategy

The preceding chapters provide the basis on which several important decisions were taken as to the terms in which information was to be collected, analysed and interpreted. This research strategy outlines what was done, the sources from which evidence was obtained, the methods by which evidence was analysed, and the operational units about which that analysis focused.

Information that could be used in defining Open Education was gathered from departmental consultants, principals and students, and was subjected to both statistical and case study analysis. The basic unit chosen was an identifiable group or class.

Various measures of student behavior provided the source data in the area of outcomes, the unit of study being the group or class, and the analysis depending on statistical treatments. In one sense, these measures could be said to sample 'true' outcomes of Open and Traditional Education as evidenced in student behavior, by providing a basis for inferential statistical comparisons between the two. That is, certain hypotheses could be proposed about differences between, and changes over time in these groups or classes, differences and changes about which quantifiable data would be available.

However, it was expected that differences and changes as measured, were likely to reflect and be modified by two main sets of constraints that might be intrinsic to the particular context in which Open Education was being studied. These constraints related to organisational factors and innovation characteristics prevailing when the study was carried out. With a few exceptions, information about these constraints was obtained from four sources; principals, teachers, students and researcher observations, and were analysed by case study methods. The few exceptions concerned parents and unpaid school officials. The unit of analysis with respect to organisational factors was the school, incorporating staff and student personnel and where appropriate, parents. In the case of innovation characteristics, the unit of analysis comprised the total school at some stages and the identifiable group or class at others.

This outline is summarised thus:

FIGURE 3.1

RESEARCH PLAN

Research strategy	Source	Method	Unit
Open Education defined	Consultants. Principals, Students performance.	Case study, Statistics	Identifiable group or class.
related to			
Outcomes	Student performance	Statistics	Identifiable group or class.
modified by			
(a) Organisational factors	Researcher observation, Principals, Teachers, Students	Case study	School
and			
(b) Innovation characteristics	Researcher observation, Principals, Teachers, Students	Case study	School, Identifiable group or class.

The nature of the relationship between Open Education (however defined) and the student behavior outcomes, organisational factors and innovation characteristics can be elaborated most satisfactorily if the terms of reference are clear. The remaining three sections of this chapter provide those terms of reference.

2. The Goal Achievement Perspective

This perspective can be outlined in two basic points. In the first place, an innovation may be developed, adopted, diffused and implemented with anticipated outcomes in mind (although the possibility must be allowed for, that just what is in mind may vary between decision-makers and adopters, and from one adopter to another). However, actual outcomes may comprise none, some or all of the anticipated outcomes and/or a range of unanticipated outcomes. Hence, in terms of goals, the innovation may lead to no achievement, partial achievement, complete achievement or, more probably in cases of innovations affecting organisation structure and relationships, goals in some measure plus extra (but not necessarily extraneous) outcomes. Presumably, identifying of goal achievements (and failures) and other outcomes has value in any decision-making likely to affect continuance of the innovation.

Secondly, the goals of an innovation may not necessarily be expressed solely or even primarily in terms of easily measurable outcomes. That is, goals may be entwined inextricably with processes. For example, in Open Education groups, teachers often claim that ongoing relationships between themselves and students, and between one student and another, are major goals. The process or just the very existence of the innovation is the goal. However, the purpose in raising this second point is not simply to acknowledge the importance, for some adopters, of innovation for its own sake but to create awareness about the possibility that goals may be hidden even from the very people who advocate and adopt an innovation most strongly.

In essence, there may be instances where a process rather than a particular outcome appears to be the goal, and other instances where the process appears to be a means leading to a goal. The latter case allows greater opportunity for analysis by conventional methodologies and statistical techniques. But in the former case a rather philosophical enquiry seems to be necessary as a first step. In this study, reference will be made to goals qua processes when these can be identified.

The main thrust of the present examination of goal achievement, however, will be directed to outcomes that might underline supposed differences between Open Education and Traditional Education in terms of student behavior. Questions of differential performance by students depending on whether they are placed in Open or Traditional groups are of concern not only to teachers but to parents who ask whether a particular set of educational experiences will affect their children in ways that they, as parents, will approve.

The goal achievement perspective, therefore, is examined by comparing differential performance of students in Open and Traditional groups on selected criteria which may be thought of as important by parents and which might act as reasonable indexes of the goals which teachers have in mind.

These criteria may be related, in turn, back to one or more of the five levels of openness.

3. The System/Organisation Perspective

In Chapter 2 above, reference was made to the Burns & Stalker (1961) classification of forms of management for organisations into mechanistic and organic systems, the former system serving well for most stable conditions and the latter for conditions of change in which new and unanticipated problems cannot easily be broken down for distribution within a hierarchical structure.

Another way of classifying organisations is that used by Blau & Scott (1962); a typology of formal organisations based on the notion of prime beneficiary. This typology arises from a simple question that can be asked of any organisation's activities: Who benefits?

Blau & Scott identify four types of organisations thus:

> "(1) 'mutual-benefit associations' where the prime beneficiary is the membership;
>
> (2) 'business concerns' where the owners are prime beneficiary;
>
> (3) 'service organisations' where the client group is the prime beneficiary; and
>
> (4) 'commonweal organisations' where the prime beneficiary is the public-at-large." (Blau & Scott, 1962:43)

Each type of organisation has special problems:

> "... the crucial problem in mutual-benefit associations is that of maintaining internal democratic processes - providing for participation and control by the membership; the central problem for business concerns is that of maximising operating efficiency in a competitive situation; the problems associated with the conflict between professional service to clients and administrative procedures are characteristic of service organisations; and the crucial problem posed by commonweal organisations is the development of democratic mechanisms whereby they can be externally controlled by the public." (Blau & Scott, 1962:43)

In essence, Blau & Scott have identified four dimensions of organisations that can be applied to the kind of relationships that may prevail between an organisation and its prime beneficiaries. The case study in Chapter 9 below uses these dimensions as a guide in analysing the relationships that prevail in schools. Although Blau & Scott actually typify organisations in terms of these relationships, the present study assumes that each of the underlying dimensions can be applied in varying degree to a vast number of organisations, including schools; that is, the presence of one dimension neither precludes nor ensures the presence of another. This is, in essence, the qualification understood from the adjective 'prime' in the criterion of 'prime beneficiary'.

The following discussion, while referring to 'type of organisation', does so on the basis that what is being referred to is the particular dimension of prime beneficiary relationships that predominates in that organisation. For example, a public hospital is predominantly a service organisation even though, in one broad sense, it can be viewed as a commonweal organisation because it is subject to the distant, external control exercised by the public-at-large as prime beneficiary. It is also, notoriously, a business organisation in which profits are seldom made.

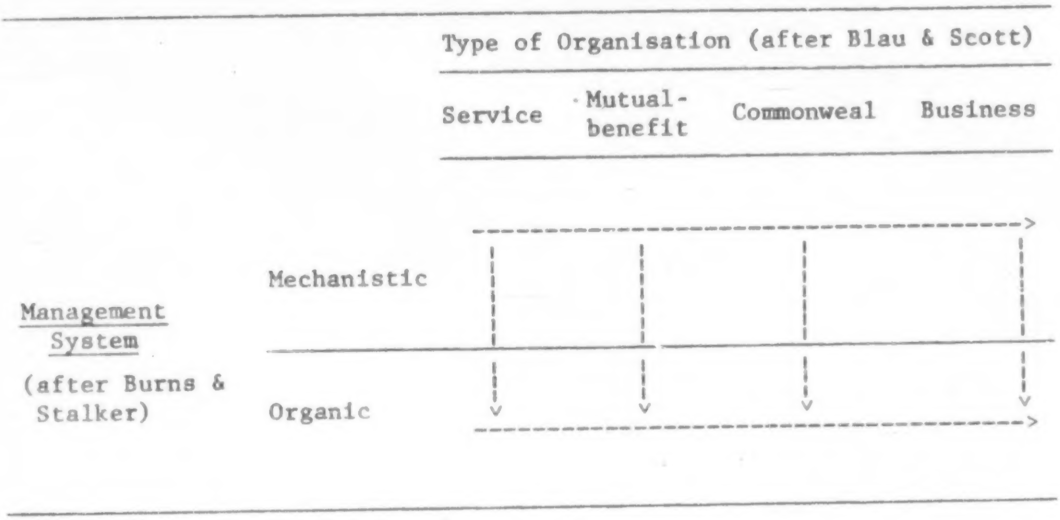
In the present chapter, the task is to relate the four dimensions of the Blau & Scott typology to the extent to which an organisation will be amenable to innovation. Amenability to innovation refers to the degree to which an organisation is responsive to the endeavors of members or outsiders to introduce an innovation, and the extent to which an organisation is liable to retain an innovation beyond the trial stage.

It should be recognised that several dimensions of amenability to innovation are feasible; the particular dimension referred to in the following discussion concerns amenability to that class of innovations likely to have profound consequences for the structure of an organisation, the role relationships that pervade the structure, and the relationships between the organisation as an entity, and its prime beneficiaries. Hence, introducing a new drug into a group medical practice to replace a less efficient drug would not involve this dimension, whereas introducing the highly complex and technologically advanced learning domes advocated by Leonard (1968) into a school certainly would do so.

The present re-ordering, therefore, is clearly not meant to embrace all innovation situations; rather it is intended as a productive way of analysing one class of innovations, and is represented in the following diagram in conjunction with the Burns & Stalker classification of management systems.

FIGURE 3.2

CLASSIFICATION OF ORGANISATIONS AND THEIR MANAGEMENT SYSTEMS FOR INNOVATION


Type of Organisation (after Blau & Scott)
Service
Mutual-benefit
Commonweal
Business
Management System
(after Burns & Stalker)
Mechanistic
Organic

The arrows in Figure 3.2 indicate the direction of amenability to innovation. The management system axis does not require detailed justification here, firstly, because its very raison d'être is focused on differences between those organisations confronting change and those confronting stable conditions; and secondly, because some elaboration has already been given in Chapter 2 above. With respect to the other axis, some argument is required because the Blau & Scott framework was not designed primarily as a device for analysing change.

For the sake of the present study, it is asserted that service organisations will, in general, prove least amenable to innovations likely to affect organisational structure and roles. The prime beneficiaries of service organisations such as hospitals, welfare agencies and schools are clients with whom members work. In providing professional services, these organisations are supposed to govern their activities by referring always to the welfare of the client. The pursuit of self-interest by service organisation professionals is treated as secondary. Furthermore, the professional is required to maintain independence of judgment to the end of fulfilling what he judges to be in the client's best interests as distinct from the client's wishes (Blau & Scott, 1962:52). That is, clients are assumed unqualified to judge what is in their own best interest. In a very real sense, then, the service organisation will almost always aim to provide a stable and predictable relationship with clients otherwise they may discourage those clients from maintaining a continuing, and necessarily a somewhat subservient response to professional advice and controls.

In terms of amenability to innovation, the distinction between mutual-benefit and commonweal organisations does not appear to be particularly sharp, and certainly not as sharp as the distinction between service and business organisations. Indeed, there may be a strong argument in favor of treating them so far as innovation is concerned as a single class of organisation with two sub-classes.

Mutual-benefit associations such as clubs, unions and political parties, are likely to be somewhat less constrained than service organisations in making changes that will affect organisational structure and roles because the prime beneficiaries (the general membership) are usually able to vote-in changes which they consider will further the aims which they had in mind in joining. The greater power exercisable by prime beneficiaries of mutual-benefit associations by comparison with prime beneficiaries of service organisations, combined with the fact that mutual-benefit organisations frequently aim to pursue some cause or other in which social attitudes and beliefs are very important, may lead to greater readiness and capacity to innovate.

In commonweal organisations, such as taxation and police organisations control resides, for most practical purposes in the hands of a few people, either appointed by the public-at-large to governmental positions or appointed to positions of control by governmental processes. Thus, because they assume certain rights (and obligations) to control the behavior of the very public that is supposed, technically, to control them, a paid elite is likely to maintain relatively independent control of the organisation beyond that which can be conveniently and realistically exercised by the prime beneficiaries. This separation of internal and external control, it can be asserted, leaves the way open for internal controllers to make decisions about innovations, based on the criterion of efficiency and without reference to genuine democratic control. That is, the few who are in direct control may tend to make decisions related to structure and roles without reference to the prime beneficiaries. The essential difference likely to render the commonweal organisation more amenable to innovation than the service organisation (which it parallels) is the absence of a delicately balanced, highly personal relationship between those providing and those receiving the services.

The business concern aims to survive and to maximise gain for minimum cost. Generally speaking, and especially in smaller business organisations, the prime beneficiaries (or owners) are expected by the community to pursue a line of self-interest within the limits only of externally imposed controls. Two factors, pursuit after operating efficiency and existence of a wide spectrum of acceptable behavior, are likely to render these organisations quite amenable to innovations that may affect structure and roles.

The Burns & Stalker notion of management systems and the Blau & Scott notion of organisational types can now be examined with regard to amenability of schools to innovations of the kind that affect structure and roles. For example, the organisation least amenable to innovation involving profound changes in structure, roles and relationships with prime beneficiaries, is likely to be a service organisation such as a school or a hospital, operating with a highly mechanistic management system. The organisation most amenable to innovation is likely to be a business organisation such as a privately owned industrial firm aiming for high profits, operating with a highly organic management system and capable of arranging itself into multi-skilled project teams.

Fundamentally, the more traditional schools of recent years appear to fall into the category of service organisations with mechanistic management systems. In a service organisation of this kind the professional practitioner's decisions are expected to revolve around his own judgment of what will best serve the client's interest, usually without allowing the client's wishes to affect those decisions because it is assumed that the professional, and not the client, holds the relevant expert knowledge. At the same time, the professional practitioner is expected to avoid the pursuit of self-interest through activities which may militate against the welfare of his clients. However, in the traditional school, dysfunctional pursuit of these activities might often be explained away on purportedly educational grounds because there is no clear boundary defining just what is really involved in client welfare, a failing due perhaps to a tradition of counter-argument or even simple lack of evidence.

Although a little more difficult to relate to the traditional school because the classroom teacher's professional activities are largely invisible to his superiors, most of the Burns & Stalker mechanistic management system characteristics are also evident at high school level. Specialised differentiation of tasks occurs with respect to subject divisions and even to support responsibilities such as yard duty. Technical improvement of means rather than the accomplishment of ends can be seen in the persistent pressures on teachers to develop good class control before they can hope for high status among their peers. Precise definitions of rights and obligations, many of them trivial, are evident both in rules and behavior. Hierarchical structuring of control, authority and communication is succinctly demonstrated in the educationally disruptive use of the school public address system. Instructions and decisions laid down by superiors, even when directed towards the behavior of students, have automatic and binding consequences for rank and file staff. Demands for loyalty to the school are commonplace. Finally, importance and prestige appear to attach more to capacity to handle the internal workings of the school than to profound understanding of a discipline or subject.

Now, while it might be argued that invisibility from superiors of certain aspects of teacher role performance might lead to role flexibility (thereby countering part of the mechanistic management argument as applied to the traditional school), the opposite is more likely to be the case. Somewhat akin to the medical practitioner working alone with a patient in surgery, the teacher working alone with a class is surrounded by a host of expectations, emanating from superiors, parents, training institutions and from students themselves; expectations that deliberately set out to protect the (client) students. Language usage, forms of address, careful treatment of controversial subjects and general demeanor are among the more visible of these expectations. So although immediate control of role performance, directly visible in many work organisations, is largely absent from the traditional school, this absence is covered by a stringent and highly internalised set of expectations.

Successful innovations in such an organisation are likely to be limited to those which do not demand changes in social structures, social processes, role performance and expectations because the professional practitioner must remain predictable, trustworthy and slow to change the patterns of social relationships and client benefits which his public has learned to understand. From the point of view of either client or professional, or both, the prospect of many innovations is likely to promote at least mild insecurity and defensive reaction in one or other quarter of the school.

The amenability of the three latter types of organisations (mutual-benefit, commonweal and business) is delineated not merely to complete the picture suggested in Figure 3.2 but to allow for another range of possibilities for the school, particularly the secondary school.

The question to be asked is this: Is it possible to develop a school that can adapt for innovation not simply by altering the management system to an organic form but by changing the nature of the prime beneficiary relationships sufficiently for that school to be classified as one or more of those organisation types with greater amenability to innovation? At this stage, the notion of 'school' should be broadened to encompass Open Education group or learning environment. Such an environment may occur in an organisation that could still be called a school, but it may also occur as part of an organisation which most people would not care to think of as a school in anything like the conventional sense.

Alteration to, or toleration of, breaches of legislation governing behavior and relationships within schools might well lead to diminution in the importance attached to compulsory attendance and to the custodial responsibilities inherent in the conventional in loco parentis arguments. Under these circumstances, relationships might well shift in the direction of the caveat emptor convention, a convention commonly associated with business concerns. If the student himself is deemed to have legitimate power or relevant expertise to nominate the methods and content of his experiences in school, and simultaneously, the role of the teacher is shifted in the direction of consultancy, an overall change in organisation type towards the mutual-benefit association may occur. Obviously, these kinds of change in behavior and legitimated relationships could alter the nature of prime beneficiary in the school, either towards another organisation type or, even more probably, towards a multi-faceted hybrid.

In terms of organisation perspective then, the present study analyses prospects of innovation continuance through the two dimensions of amenability to innovation (management system and prime beneficiary). Case study methods are utilised for the analysis.

4. Innovation Characteristics Likely to Modify Student Performance

If all students and teachers involved in Open Education programs could be prepared in some ideal way for the implementation of those programs, the associated organisational characteristics, personal qualities, attitudes and cognitive pre-training could be taken for granted and any differential outcomes between performance in Open and Traditional environments related only to differences in the particular programs. However, we must assume, given circumstances less than the ideal, that intended outcomes might be modified by lack of preparation of teachers and students, and by the lack of certainty about what to expect; that is, by the innovative nature of Open Education. Furthermore, unanticipated (and perhaps, unwanted) consequences may arise.

The question now becomes: What are the characteristics of an innovation such as Open Education that are likely:

(a) to mediate between the pursuit of anticipated outcomes and the actual outcomes achieved; and

(b) to generate unanticipated outcomes?

Rogers (1962) provides a useful basis for a case study focused on this question.

(i) Relative advantage is "... the degree to which an innovation is superior to ideas it supersedes." (Rogers, 1962:124). The nature of the innovation will determine whether relative advantage is social, economic or political. Relative advantage can be assessed in two main ways; through the perception of individuals and groups, and/or through measurement of some productivity factor. Furthermore, such assessment can be used to analyse pay-off at any or all of the five conceptual levels already applied to the discussion on openness. Relative advantage might affect both the rate of adoption and the extent of diffusion of an innovation, and both of these may be influenced, in turn, by the degree of crisis involved in the motivations that gave rise to the innovation in the first place. In the context of Open Education as introduced into Victorian high schools, for example, the crises outlined in Chapter 1 above will require consideration in any discussion of relative advantage.

(ii) Compatibility is "... the degree to which an innovation is consistent with existing values and past experiences of the adopters." (Rogers, 1962:126). If an idea is quite incompatible with the prevailing norms of a social system, innovation may proceed very slowly or not at all, being recognised by the members of the social system as foreign and unwanted. At the other extreme, an idea which is so compatible with the prevailing norms of a social system that it cannot be distinguished from them, is unlikely to lead to innovation at all. Theoretically, there will be a point of threshold on the continuum of compatibility below which no innovation can be perceived and above which a just noticeable difference exists to allow innovation to be perceived and acted upon.

(iii) Divisibility[1] is "... the degree to which an innovation may be tried on a limited basis." (Rogers, 1962:131). Fundamentally, there are two approaches to divisibility. The first involves the use of parts of the innovation rather than all of it. The second involves limited use in terms of time. As an example of the first, the only decision-making available to students in certain programs purporting to be open might relate to choice of assignment topics. With respect to the second, an Open Education program that is very extensive in coverage of methods and conditions might be used for two days per week with a given group of students.

It is also conceivable that certain innovations may be threatened with failure, either at the trial stage or in the long term, if they are treated as divisible, while others may be threatened if they are not treated as divisible. Hence, part of the analysis in the present research must be directed towards consideration of whether Open Education as defined in Chapter 4 falls more readily into the first or second categories, or whether it is somewhat more flexible and does not fall readily into such mutually exclusive categories.

(iv) Communicability is "... the degree to which the results of an innovation may be diffused to others." (Rogers, 1962:132). Among the components of communicability three are worthy of special mention. Visibility is an important component in that it may add glamor, corroborative support and dramatic effect to extant claims about the worth of innovation. In contrast, lack of visibility may weaken communicability by leading to doubts and low credibility. Innovations which are designed for preventive purposes rather than for curative or developmental purposes may be particularly susceptible to poor communicability (e.g. Hruschka & Rhinewald, 1965).

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[1] The term 'trialability' is not preferred here because the notion of 'psychological trial', incorporated by Rogers & Shoemaker (1971:155), is excluded from the present discussion.

Associated with low visibility is lengthy time lag before effect. Innovations, the effect of which may not be seen for several years, may tend to assume unreal qualities. They may sound interesting yet not appear relevant. In recent decades many innovations concerned with environmental ecology have suffered in this way. In some cases, communicability is made all the more difficult because, while the 'good' effects of the innovation are somewhat removed in time, undesirable effects may be immediately and readily seen; a problem of discounting the future.

The third component is that of language. If an innovation can be outlined in words that the potentially adopting public can understand and the relative advantages are clear, and the inherent ideas are compatible, the chances of successful innovation should improve. Where these latter characteristics are in evidence but the language is difficult the chances of successful innovation may worsen. However, there may be some instances where the use of technical language that is well understood by relatively few individuals, will be advantageous; for example, where the few individuals who do understand have high technical competence along with high status as opinion leaders, and who will be viewed as entirely trustworthy by their colleagues or fellow citizens.

(v) Complexity is "... the degree to which an innovation is relatively difficult to understand and use." (Rogers, 1962:130). Presumably innovations low in complexity will diffuse more readily than those which are both complex in themselves and which are complex in the sense of requiring a wide range of support activities and processes.

Three aspects of complexity can be considered. In the first place, the innovation may be sufficiently complex to require adoption of new mental sets by adopters. Where an individual has taken for granted that a particular aspect of social reality is grounded in what he considers are irrefutable laws of behavior, the innovator's problem is greater than that of establishing compatibility. The innovator may have to teach a new philosophy, a new doctrine and new 'laws', leading his public to an understanding of the relativity of such laws as opposed to any absolute qualities. The matter of teacher control over student behavior may be instanced in the case of Open Education.

Secondly, members of the adopting population may require extensive re-training in specific skills pertinent to the innovation, resulting in hours or even weeks or months away from the job, as well as in additional costs, staff replacement problems and temporarily reduced productivity. Even the training programs themselves may encounter problems of insufficient staff and resources.

Thirdly, there will be innovations so complex in character as to require a number of consequential innovations for each of which detailed planning and implementation are necessary. The problems encountered by organisations that purchased computers in Australia in the early 1960's (problems of waste arising from inadequate programming and under-utilisation) may be related to failure within those organisations to understand just how extensively the basic structures and processes of organisation would have to be revised to ensure successful continuance of the innovation.

5. Summary

If all teachers and students were as well versed and practised in alternatives to Traditional Education as they are in Traditional Education itself, the researcher could look forward to uncomplicated evaluation of say, Open Education defined in a certain way, compared and contrasted with Traditional Education.

While the present study endeavors to make some headway in this regard, attention is also given to two major complications likely to confound any measured effects of the different educational environments currently operating in Victorian high schools. The first of these complications concerns the extent to which the organisational type of the school and the management system employed in it, constrain or facilitate the innovation of Open Education. The second complication relates to the very innovative characteristics of Open Education.

The next chapter details the research design necessary for evaluating effects *per se* and the case study strategies utilised to provide an understanding of the two areas of complication.

CHAPTER 4

RESEARCH DESIGN

Introduction

In a 'true experiment' Open Education would be defined and individuals assigned randomly to experimental and control groups. The experimental group would then receive a treatment, Open Education, while the control group would receive no treatment. In more sophisticated experiments a number of alternative treatment groups might be included as well. Such procedures as these are unworkable in the present case for two very sound reasons.

In the first place, Open Education groups in Victorian high schools have evolved largely in response to circumstances prevailing in given localities and schools and reflect, in turn, the philosophies and personalities of the people associated with particular programs. However untidy it might seem, Open Education cannot be viewed at present as a treatment to be switched on and off nor as one to be transferred from location to location or from person to person as a result of an edict from a researcher. Rather, Open Education groups must be seen in the context of a growth process, or of phenomena which the researcher and perhaps the administrator must accept as occurring naturally on the research stage and not amenable at present to very much researcher manipulation.

Secondly, the assignment of students to no-treatment or alternative-treatment groups harbors profound ethical considerations about the extent to which a researcher, who has no particular legal obligation to child, parent or teacher can interfere with the lives of the children he studies.

Attention has already been given to the point that Open Education, at least as it is understood in Victorian high schools, is properly viewed as a process differing from other approaches more in degree than in any absolute sense. Indeed, many of the questions asked about Open Education are framed in a context of reaction against what is seen as Traditional Education. Individuals working with Open Education groups are not acting in isolation from the broad spectrum of relatively formal education; hence Traditional Education ought to be seen as an approach involving the same or similar dimensions to a greater or lesser degree rather than as a non-application of Open Education. The need for comparing and contrasting Open and Traditional Education is virtually built into the innovation of Open Education.

In short, an evaluation of effects of Open Education on students is not the suitable subject of a true experimental design; therefore, a quasi-experimental procedure is used. Because the initial aim was to investigate without damaging the basic integrity of the Open groups for the sake of statistical expediency the character of the present exercise is perhaps best described as a 'natural experiment'.

1. An Approximation of the Non-Equivalent Control Design

The design used for statistical evaluation of student performance in Open and Traditional groups can be expressed thus:

R(assumed) XOPEN 0_1 XOPEN 0_2

R(assumed) XTRAD 0_3 XTRAD 0_4

As suggested in the Introduction to this Chapter, Open Education and Traditional Education might be viewed as differing in degree more than in any absolute sense.

The 'best' examples of Open Education and Traditional Education as defined below in Chapter 5 were sought and observed twice for the present study (which should be seen as part of a longitudinal study extending over six years). Random allocation to each group was approximated by concentrating the study at the level of first year of secondary school. Entry to these schools was primarily on the basis of zoning and it could reasonably be assumed that across the State as a whole, pre-entry behavior and educational experience of students was not related to their placement in an Open or Traditional environment.

Nevertheless, one of the two statistical procedures adopted took account of possible lack of randomness; namely, analysis of covariance which was used to compare criterion changes over time by treating results obtained in observations 0_1 and 0_3 as covariates.

As McGaw (1973) observes, the techniques for analysing change in group performance are separable either into a category where analysis is based on total change from initial status to final status (absolute change) or into a category where analysis is based on only that part of the final status which cannot be predicted from initial status (unpredictable change). Gain scores (Lord, 1956 and 1958) constitute examples of absolute change measures while analysis of covariance (Cronbach & Furby, 1970) is the most usual example of techniques that cope with unpredictable or residual change. Some controversy has prevailed not only around the choice of one or other of these techniques but also about the choice of parametric or non-parametric statistical techniques; parametric techniques assuming an underlying interval scale and a meaningful frequency distribution, and non-parametric techniques making no assumptions about the shape of the distribution of scores in a population or about the equivalence of units along the scale (Gardner, 1972).

In respect of the first controversy, the analysis of covariance technique, despite the technical problems outlined by McGaw (1973) was chosen in the present study to measure relative change over time for reasons outlined in the following sections of this chapter. In respect of the second controversy, the works of Lord (1953), Kempthorne (1955), Gaito (1960) and Anderson (1961) lend support to the view expressed by Glass et al (1973) that the flight to non-parametric statistics has been unnecessary anyway.

The second statistical treatment used in the present study involves t-test measures of differential performance between various breakdowns of groups on each of $0_1/0_3$ and $0_2/0_4$.

In terms of the 16 experimental and quasi-experimental designs outlined by Campbell & Stanley (1963), the present design most nearly approximates Design 10, the Non-Equivalent Control Group design, in which both experimental and control groups are pre-tested and post-tested but in which pre-experimental sampling equivalence is substituted by the use of naturally occurring groups in which allocation can be assumed as random and under experimenter control. There are two variations from Campbell & Stanley's Design 10 in the present design. The first is that, for technical reasons, it was not possible to carry out $0_1/0_3$ prior to the onset of the Open and Traditional programs. In fact, both sets of programs had been in operation for approximately six weeks when $0_1/0_3$ data were collected. Judicious use of the results obtained from both t-test and analysis of covariance computations largely overcame this problem. The second variation is that a so-called control group (Campbell & Stanley, 1963:47) is used in the present study not simply as a control or benchmark but as an active alternative treatment. This approach appears, on face value, to be more honest and more productive in its recognition that environments other than Open environments are best distinguished by what they do achieve rather than what they do not achieve.

The use of a quasi-experimental design of the kind described above involves certain risks. In respect of any alleged differences between groups (e.g. Open and Traditional) at a given time there arises the possibility that the criteria chosen by which to explain such differences might not be considered particularly important by the organisers of one or both groups. Some attention is paid to this problem below in the Introduction to Chapter 6.

There were also risks concerning internal and external validity. That is, there were potential sources of invalidity involving extraneous variables that might generate plausible hypotheses to rival the research hypotheses in explaining $0_1/0_3$-$0_2/0_4$ differences. Each of these sources will be considered in turn, because interpretations made from this kind of research can maintain credibility only if rival hypotheses can be discounted (Campbell & Stanley, 1963:209).

2. Factors Influencing Internal Validity

2.1 History

Between the first and second testing sessions there could have occurred specific events not related to the main variable of Open/ Traditional Education. For example, teacher strikes, had they occurred, may have had a more deleterious effect on the performance of students in Traditional groups because of the presumed greater dependence of students on teachers in those environments by comparison with Open groups. In fact, there were minor stoppages in some Victorian high schools during the research period, but only a very tenuous rival hypothesis could be proposed on the basis of these stoppages. Because the study comprised groups from 20 schools located all over the State, a plausible rival hypothesis would almost certainly need to have arisen from factors affecting the whole State high school system. Factors affecting individual environments would not have influenced the study profoundly because the statistical analysis dealt with combined rather than individual groups.

2.2 Maturation

In the present study there were several potentially important maturation factors related to the cognitive development of students and their social interaction skills. These factors were placed under reasonable control by designing the study to utilise Traditional Education groups partly as a control. Although the ages of students varied somewhat the vast majority were either 11 or 12 years. Differential maturation rates between age groups were accounted for by using mean scores for intact groups of students when the criterion variables were analysed.

2.3 Testing

The major precaution against the first testing influencing the responses obtained during second testing was the test lapse interval of eight to nine months. It was not assumed that pre-test effects were inoperative, but the $0_1/0_3-0_2/0_4$ time interval was expected to minimise these effects.

2.4 Statistical regression

The part of this research given over to statistical analysis involved isolating groups on the basis of extreme mean scores. To a certain extent, then, the risk of statistical regression had to be accepted. The use of analysis of covariance in making judgments about changes over time provided a conservative approach to this risk, and although there could be no guarantee given of homogeneity in regression (a necessary assumption in this use of analysis of covariance) there appeared to be no good reason to suggest that any regression would be other than homogeneous.

The main control for regression came from retaining in the extreme groups of Open and Traditional environments only those units which fell within the appropriate quadrants on a two-way median split of two main variable measures at both testing sessions (see Figures 5.1 and 5.2 in Section 3 of Chapter 5 below). In respect of the criterion variables, the only safeguard against regression as an alternative explanation to the research hypotheses, additional to the use of analysis of covariance, was the adherence to group means as the basis of analysis.

A second assumption about regression in analysis of covariance was also considered; that residual variances would be "normally and independently distributed with zero means and the same variance." (Winer, 1962:586). That is, it had to be assumed that an appropriate regression equation had been fitted; in this case, a linear equation.

Notwithstanding these risks two comments of encouragement can be offered about the present design. In the first place, careful interpretation of results is likely to assist greatly in reducing the potential regression problems. Secondly, as Winer suggests, the "... F tests in the analysis of covariance are robust with respect to the violation of the two assumptions, normality and homogeneity of the residual variance." (Winer, 1962:586).

2.5 Selection

Students in the groups included in the study were selected for those groups on the basis of administrative decisions within each school. At no stage was an individual student able to make choices as to his continued attendance in one or other kind of educational environment. Likewise, there were no cases reported during the research of students being included or excluded from the various groups because of personal characteristics other than age/grade level characteristics.

2.6 Attrition

All students included in the data analysis were involved in the relevant education groups for the full period of investigation and had completed both pre-test and post-test requirements. The only attrition from intact groups occurred through normal transfer from one school to another because of family location, and through absence from one or other testing session. In each case, the numbers were small.

2.7 Selection - maturation interaction

All groups were comprised of students whose pre-entry behavior in respect of the four criterion variables could only be seen as covering a range similar to the whole age/grade population throughout Victorian high schools. No selection-maturation interactions were anticipated.

3. Factors Influencing External Validity

Campbell & Stanley suggest that the factors most likely to influence external validity (or representativeness) are the interaction of selection and treatment, the interaction of selection and testing, reactivity of testing, and multiple-treatment interference (Campbell & Stanley, 1963:175-176).

In the present study, the potential influence of the first three of these factors was considered to be quite negligible although some problems could be foreseen with the fourth. Having attended primary schools in the years immediately prior to entry in the Open and Traditional high school programs, all of the students in the study had received 'treatment' of some kind. However, these treatments were reasoned to be randomly distributed throughout the various groups when, in truth, some of the Open and Traditional groups contained a preponderence of students from the same class at a particular feeder school. Again, the choice of analysis of covariance as the statistical technique by which to measure changes over time was important.

The other main source of multiple-treatment problems was the tendency for some groups in the study to be part-time Open or Traditional groups. This occurred particularly where a principal or teachers felt some lack of confidence about becoming too innovative. The culling procedure used in defining Open and Traditional groups for the purposes of statistical analysis, however, meant that groups which appeared likely to manifest multiple treatment problems were utilised only for comparative purposes in the case studies.

4. Case Study Strategies

Organisational factors and innovation characteristics were considered likely to influence the successful innovation of Open Education and to modify the effects of Open group membership on students. Because of the exploratory nature of the present study, case study techniques were thought to be quite appropriate to assist in elaborating these factors and characteristics.

The choice of virtually any methodology that is primarily a qualitative methodology highlights problems that exist in, but are less often recognised in, quantitative methodologies; particularly the problems relating to valid data and legitimate interpretation of data. Various writers including Trow, Becker, Deutscher and Mann have detailed these problems in Filstead (1970), and others such as Smith (1972) have been rather successful in overcoming these and associated problems in applying qualitative methodology to educational settings.

In the present study a general interview schedule was used in interviews of principals, teachers, students and, occasionally, other individuals such as parents and voluntary officials. While virtually any digression from the schedule was allowed according to the whim of either researcher or interviewee, a basic pool of information was gathered around the frameworks of management system/organisation type and innovation characteristics, as outlined in Chapter 3 above.

Some of this material was recorded on tape, although not all of it could be so recorded because of its confidential nature and the need to preserve anonymity. That which could not be recorded on tape was recorded in summary on cards to which only the individuals who provided the information and the researcher would have access. Co-operation of several principals and teachers was founded on this assurance.

The data are used in Chapters 9 and 10 primarily in generalised form but with interspersion of specific comments and facts to corroborate or exemplify an abstracted point when it is appropriate to do so and, in addition, when anonymity is unlikely to be placed at risk. The acceptability of evidence presented in this way rests in the long term on the incorporation of the present data into the investigation procedures that will follow the present study, at which times specific hypotheses will be tested in addition to the collection of case study material by individuals other than the present researcher.

5. Summary of Discussion on Research Design

The nature of the phenomena to be investigated are 'natural' in character and not amenable to 'true experimentation'. A quasi-experimental method approximating Campbell & Stanley's (1963) Design 10, the Non-Equivalent Control is used as the basis for testing differences between, and relative changes over time in the groups of students chosen as the subject of investigation. Inferential statistical procedures are applied to test various effects among the groups of students, the differences at each observation being examined by t-testing combined groups of means, and the changes over time being examined by analysis of covariance.

The modifying influences of organisational factors and innovation characteristics are investigated by case study methods involving interviews and participant observation.

CHAPTER 5

IDENTIFYING OPEN AND TRADITIONAL GROUPS

1. The Sample

The sample was selected with reference to the following rationale. In the first place, the focus of the study was upon the somewhat unique developments occurring in Victorian high schools from the late 1960's rather than on developments in either the primary or technical schools. Because at least one study of substance concerning Open Education in primary schools has commenced recently in Australia and because it is intended that a longitudinal cohort will be picked up from Victorian technical schools and private schools when the present investigation moves to the subsequent stages outlined in Chapter 1 above, adequate coverage of the entire school system can be anticipated in future.

Secondly, in order to achieve approximate randomness in respect of pre-entry behavior of students as a feature of the basic research design, concentration was placed on students experiencing their first year of secondary schooling.

Thirdly, the most useful unit of investigation was reckoned to be the intact class or group because of the exploratory nature of the study. Data collected for use as group data could then be re-analysed after the present study if necessary, on the basis of individual or other characteristics.

Fourthly, a decision was taken to investigate only co-educational groups even though no breakdowns on the basis of sex were anticipated. Again the data could easily be re-analysed to account for this factor subsequently.

A fifth aspect of sampling arose out of interviews with principals and teachers at the time when overall feasibility of the study was being canvassed in the schools. Frequent reference was made on these occasions to the likelihood that two features of the general environment of a school might account for many differences between groups apart from the differences relating to Open or Traditional features. These features were the location of schools in metropolitan or country areas and the size of schools. Therefore, sampling took account of whether a school lay within the boundary of the Melbourne and Metropolitan Board of Works area and whether a school was larger than 350 students.

Understandably, several schools classified as rural were in provincial centres, some in medium sized country towns and a few in small towns; however, the element common to all was their substantial provision of services for farming communities. With regard to size of school, the figure of 350 was suggested by principals to be one above which the scale of operations changed significantly both in terms of administration and in terms of staff/staff and staff/student relations.

The main advantage in these delimitations was that a number of sources of variability could be accounted for or eliminated which, although interesting would have made the project unmanageable in size and complexity. However, it should be noted that the rather vexing issue of school architecture was placed aside firstly because of the apparent failure of studies already completed (see Chapter 2) and secondly because the makeshift conditions in which many groups operated made it pointless to distinguish features of space that would have much meaning.

2. Defining and Locating Open and Traditional Groups

Lack of consensus among teachers as to what were the pivotal characteristics of Open Education posed a major problem in arriving at definitions. At the time when a decision was required in this regard most of the operationalising studies referred to in Chapter 2, Section 2.5, had not been forthcoming and even if they had, their direct application to the state of affairs in Victorian high schools would not have been entirely appropriate (e.g., Bussis & Chittenden, 1970; Stewart & Angus, 1971; Traub *et al*, 1972; Walberg & Thomas, 1972).

Consequently, a five-point definition was constructed from the ideas expressed in the writing of Hannan and others in *The Secondary Teacher*, from the ideas expressed during interviews designed to test the feasibility of the project, from the researcher's own prior knowledge of the developments in the high schools, and in particular from J.R. McLeod whose contribution to the development of Open Education in Victoria has already been acknowledged in Chapter 2, Section 1. Perhaps the similarities between the definition used in this study and other definitions, especially that of Walberg & Thomas (1972) should not create surprise. This current definition is detailed in the section below.

The basic strategy for locating Open and Traditional groups was designed in four stages involving rater assessments and student-based indexes. The main assumption was that the characteristics of Openness and Traditionalism lay on continua and were not discrete categories; hence one could speak of relatively Open and relatively Traditional groups differing from each other in the extent to which they exhibited these characteristics. Given this assumption the problem largely became one of isolating the extreme ends of the continua, one end indicating Openness, the other Traditionalism.

2.1 Rater assessment of Openness and Traditionalism

Two Education Department psychologists and two curriculum specialists were asked to nominate from Victorian state high schools those which housed the 'best' examples (at Form 1 level) of Open and Traditional Education in the sense of providing learning environments that stimulated most and least the following characteristics:

(a) diversity of activity and problems for learners, giving rise to a wide variety of outcomes many of which may not be predictable;

(b) dialogue in which exchange and discussion of ideas was used as the basis for collaborative thinking that might be expected in a community of scientists;

(c) growth of ego strength in individuals such as might be observed through the degree of assurance they display in decision-making;

(d) self-reliance in collating and sorting information; and

(e) the development of communication skills, especially those relating to vocabulary and syntax.

In addition the raters were asked to take into account the extent to which these first year groups were committed to a rigid timetable.

The 'best' examples were described to the raters as those that would be considered 'good' schools by the respective devotee teachers of Open and Traditional Education.

The rater judgments are summarised in Table 5.1, the bottom line of which indicates the number of schools in each category mentioned by at least three of the four raters.

TABLE 5.1

RATER JUDGMENTS OF NUMBER OF VICTORIAN HIGH SCHOOLS WITH OPEN AND TRADITIONAL PROGRAMS AT FIRST YEAR LEVEL IN 1971

Rater	Open	Traditional
1	27	24
2	15	20
3	17	25
4	15	18
Number commonly rated by three or four raters	15	12

The higher number of Open programs does not represent any ratio of Open to Traditional programs throughout Victorian high schools. The true ratio at the time would have fallen very much in favor of Traditional programs. However, considerable publicity had been given to the innovative activities of schools with Open groups, hence common rating was not surprising. The lower number of commonly rated Traditional programs was due to the large number of alternatives available from which the raters could choose.

The 15 schools with groups commonly classified as Open and the 12 schools with groups commonly classified as Traditional were used in the second stage.

2.2 School principals' assessments of Openness and Traditionalism

The principals of these schools were then asked to agree or disagree with the proposition that their schools were operating Open or Traditional groups at first year level. Principals of three schools with groups classified by the raters as Open disagreed with the rater judgments after examining the definitional characteristics. In each case the disagreement centred around the limited application of 'general studies' curricula in which the content of 'non-core' subjects like History, Geography and English had been integrated under one heading and timetabled accordingly, but in which little other change was either evident or intended. The principal of one school which the raters had classified as Traditional also disagreed, but on the grounds that the late appointment of a teacher well known for his innovative practices had caused an alteration of plans for Form 1.

At this stage 20 schools were chosen for inclusion in the project on the basis of the breakdown given in Table 5.2. One large rural, and three large metropolitan schools were randomly deleted to achieve a semblance of balance. Unfortunately, it was not possible to ensure even numbers of Large and Small schools through each other category.

TABLE 5.2

BREAKDOWN OF GROUPS IN 20 VICTORIAN HIGH SCHOOLS BY MAIN VARIABLES, BASED ON RATER AND PRINCIPAL JUDGMENTS

School	No. of Students	Main Variable 3	Main Variable 2	Main Variable 1
00	(31)	Large	Metropolitan	Open
01	(24)			
02	(27)			
03	(33)	Small		
04	(20)			
05	(30)	Large	Rural	
06	(30)			
07	(27)			
08	(27)	Small		
09	(30)			
10	(38)	Large	Metropolitan	Traditional
11	(30)			
12	(26)			
13	(32)	Small		
14	(28)			
15	(31)	Large	Rural	
16	(27)			
17	(27)			
18	(31)	Small		
19	(26)			

Totals:
Large = 12
Small = 8
N = 20
Metropolitan = 10
Rural = 10
(Students n = 577)
Open = 10
Traditional = 10

Groups from these 20 schools were then included in the test procedures that comprised the third and fourth stages of identification. The third stage consisted of an Organisational Stringency Index administered to students, and designed to plumb relevant aspects of organisational climate. The fourth stage consisted of The 'Things Teachers Say' Test in which student perception of the demeanor of teachers could be examined.

The development and testing of these instruments and their administration procedures are detailed below in Sections 2.3 and 2.4.

2.3 Organisational Stringency Index

Organisational stringency refers to the tendency for an organisation to be structured and operated in such a way that its members and/or clients find it "... strict, precise, requiring exact performance, leaving no loophole or discretion."[1] It is the tendency for an organisation to be highly enfolding, rigorous, coercive, compelling of assent and thorough-going to the point of pettiness. Several teachers who claimed to operate Open Education groups for their students were said by McLeod to associate the presence of a high level of these characteristics with Traditional Education and to associate a low level with Open Education.

Similar notions have been used elsewhere in sociology and psychology. Reference has been made already to the Burns & Stalker (1961) mechanistic and organic forms of management. The idea of open and closed climates in schools has been investigated by Etzioni (1961) and, in somewhat different vein, by Halpin & Croft (1963), among many others. However, studies carried out in this mould have tended to overlook the point that organisational behavior may be reflected primarily in a specific, identifiable group or class within the school and only secondarily in the general administrative climate of the school. This point is based on the assumption that the teachers who have day to day contact with and control over a group of students must to some extent cushion the general administrative policies of the school and create a buffer zone between such policies as they are written and as they are interpreted by particular teachers.

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[1] Concise Oxford Dictionary definition of 'stringent'.

The Organisational Stringency Index seeks to reflect this observation by focusing on the way policies and practices operate by the time they reach a given group of students.

2.3.1 Construction of the Organisational Stringency Index

Ninety opinion statements were either devised from student and teacher interviews conducted for the purpose at the time of assessing feasibility or were adapted from relevant sections of Stern's (1970) Environment Indexes. Face validity of the concept was assumed on the basis of unanimous agreement by seven judges[2] that it was pertinent to the organisation of groups within the school. The same judges were then asked to select those opinion statements relevant to the concept of organisational stringency regardless of whether such statements were positively or negatively oriented. Thirty-nine statements judged relevant by at least six of the seven judges were included for further trial by schools.

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[2] Faculty staff and research scholars in the Faculty of Education, Monash University.

One hundred and sixty-three second year high school students from four schools were used as subjects for the trial. The procedure devised by Likert (1932) was adopted; subjects were asked to respond on a five-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree, Not Sure) to each statement. For all statements reflecting a high level of organisational stringency responses were scored, 1, 2, 4, 5, 3, respectively; for all statements reflecting a low level, responses were scored 5, 4, 2, 1, 3, respectively. All responses were then computer-analysed (Program ATTSCAN-5) to reveal:

(a) total scores obtained by each subject;

(b) the mean, standard deviation and split-halves reliability of the scores;

(c) the frequency distribution of the scores;

(d) the item popularity of each statement;

(e) the Edwards' t-value and its associated probability value for each statement; and

(f) frequency counts of the responses to each statement.

The item popularity of a statement for which agreement would indicate a low level of organisational stringency was the percentage of subjects expressing some form of agreement with the statement; where agreement would indicate a high level of organisational stringency, it was the percentage of subjects expressing some form of disagreement. Statements with very high or very low popularity could not be expected to discriminate amongst subjects because virtually all subjects would score the same.

The Edwards' t-value (Edwards, 1957) provided a measure of item discriminatory power for each statement, being dependent on the difference in mean scores obtained on the statement between the 27 per cent of subjects receiving the highest scores on the whole index and the 27 per cent receiving lowest scores. High t-values indicated that statements were contributing effectively towards measuring the continuum underlying the whole index, whereas a low t-value meant that the statement was either measuring an opinion unrelated to the other statements or else was ambiguous. A value of $t = 1.75$ was accepted as the lower limit for inclusion in the final version of the index; this value being generally acceptable and ensuring a related probability value of less than .05.

Eight statements failed to meet the criterion of $t \leq 1.75$ and were deleted. One other statement scored an item popularity of 96.09 per cent and was also deleted as non-discriminating. Of the 30 items to be included in the final version, 20 showed Edwards' t-values whose associated probability values were less than .0001 while only one showed a value greater than .01. Table 4.3 lists the items and the related percentages and probabilities.

2.3.2 Reliability of the Organisational Stringency Index

The split-halves reliability of the 30-item index was 0.82, which after the Spearman-Brown correction[3] was applied, converted to a measure

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[3] The Spearman-Brown Prophecy formula provides a way of estimating the reliability of a total test from the split-halves reliability coefficient when complete alternative forms of the test are not available. Thus, when R = correlation between two comparable test forms and r = correlation between two half tests,

$$R_{(\text{estimated})} = \frac{2r}{1+r}$$

of reliability for the whole test of 0.90.

2.3.3 Organisational stringency as a valid hypothetical construct

The fact that so many of the 39 items selected by the seven judges from the original 90 items were so highly discriminating suggested, firstly, that organisational stringency was a valid hypothetical construct and, secondly, that the final version of the index was likely to be a valid measure of that construct.

TABLE 5.3

ORGANISATIONAL STRINGENCY INDEX

PERCENTAGES AGREEING WITH OPINION STATEMENTS

Item	Percentages in agreement			Edwards T	P
	Schl A+B	Schl X+Y	Overall		
2. You need to do a lot of homework if you want to get on here.	14.06	66.67	39.84	4.30	.0001
3. Once you've made a mistake it's hard to live it down in this class.	12.50	28.57	20.31	2.68	.0100
4. The teachers plan for us to do interesting things together outside of school time.	68.75	90.48	79.69	4.28	.0001
5. The teachers spend a lot of time just making us obey rules.	56.25	58.73	57.81	4.42	.0001
7. The teachers make sure we speak respectfully to them.	90.63	90.48	89.84	3.31	.0010
9. People around here can really say what they think.	37.50	77.78	57.03	7.79	.0001
10. People here do things on the spur of the moment.	50.00	52.38	50.78	1.95	.0500

TABLE 5.3 (Continued)

Item	Percentages in agreement			Edwards T	P
	Schl A+B	Schl X+Y	Overall		
11. People here have to be careful about the way they dress.	73.44	85.71	78.91	2.49	.0100
12. The teachers are broadminded.	39.06	49.21	43.75	3.24	.0010
13. Attendance is checked carefully.	56.25	95.24	75.00	3.63	.0010
15. They prefer you to dress for comfort not just appearance.	59.38	80.95	70.31	4.96	.0001
16. The teachers allow discussion about sex.	79.69	92.06	85.16	4.64	.0001
17. There is a strong school spirit in this class.	42.19	63.49	53.13	5.09	.0001
18. We like talking about the problems in a subject just for the fun of it.	48.44	52.38	50.00	1.97*	.0500
20. Students like to get criticism and advice from teachers.	40.63	63.49	52.34	5.50	.0001
22. New ideas are always being tried out here.	10.94	53.97	32.03	8.03	.0001
23. They spend more time planning and organising than actually getting things done.	53.13	47.62	50.00	2.39	.0100
24. People here speak openly and freely.	31.25	73.02	51.56	6.74	.0001
25. Teachers get annoyed when students disagree with them in class.	43.75	66.67	55.47	6.29	.0001
29. If you are ill they expect you to forget work and take it easy.	59.38	87.30	73.44	6.72	.0001

TABLE 5.3 (Continued)

Item	Percentages in agreement			Edwards T	P
	Schl A+B	Schl X+Y	Overall		
30. We often do things in a new way.	18.75	52.38	35.16	7.63	.0001
31. Everyone is expected to look and act 'right'.					
32. People here are reasonable about school rules; they take it easy.	48.44	68.25	57.81	6.57	.0001
33. Rules are very important around here.	67.19	80.95	73.44	4.74	.0001
34. Most of our teachers are strict.	51.56	66.67	59.38	4.89	.0001
35. They try to make sure you don't get away with anything around here.	70.31	76.19	72.66	4.73	.0001
36. There is a lot of 'red tape' in this place.	42.19	79.37	60.94	7.72	.0001
37. While you're here they try to keep you under close control.	48.44	84.13	66.41	7.03	.0001
38. No one takes work too seriously here.	56.25	57.14	56.25	3.26*	.0010
39. There is a lot of freedom to do things in your own way.	28.13	77.78	52.34	13.34	.0001

The two items asterisked in Table 5.3 were deleted from the scale after the present study had been completed. In a validation study based on a sample of more than 500 students, Item 38 failed to register a significant probability value and Item 14, while it maintained a probability value of .05 in the same study, has proved to be non-discriminating in two subsequent studies.[4]

2.4 The 'Things Teachers Say' Test

Loosely structured interviews were conducted with ten teachers working in Open groups at other than first year level. These teachers were selected from the schools nominated by raters (see Table 5.1). The purpose of these interviews was to provide a framework of 'teaching consequences' of Open Education. Analysis of the transcripts from the interviews revealed four areas of importance:

(a) Curriculum design in an Open Education environment should allow for -

  (i) more freedom of choice for students about work tasks than would occur in Traditional Education;

  (ii) more freedom for students to work at individually preferred rates;

  (iii) more individual attention from teachers;

  (iv) less evaluation of student progress by way of identical examinations for all children; and

  (v) fewer occasions when a whole group would study the same material at the same time.

(b) Decision-making about school rules should be arranged in collaboration with students. In particular, students should act more autonomously than would be the case in Traditional groups and significantly less stress should be given to authority-induced behavior.

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[4] The first of these studies was conducted by the author and the other two studies by graduate students in collaboration with the author.

(c) Verbal exchanges between learners should increase in number and content as the frequency of situations demanding pedagogical isolation is reduced.

(d) Students should co-operate with each other in day to day educational tasks.

The first effort to design a test around these areas resulted in an instrument comprising three sections to probe student observations about actual teacher behavior, teachers' intentions concerning evaluation of student performance, and rater judgments about teacher behavior. However, the administration of such an instrument required more time than either the schools or the raters could reasonably allow. A second effort resulted in the abandonment of the teacher' intentions and rater' judgments sections. The line of reasoning applied was that observations about teachers, deriving from 30 or more students would provide a fairly reliable pool of data. Furthermore, as Keddie (1971) also points out, it was felt that teachers are sometimes incongruent in what they say they do and the way they actually behave; so on this ground as well the students' observations seemed preferable.

2.4.1 Construction of The 'Things Teachers Say' Test

Interview transcripts were used as a basis for devising 40 statements. These statements were intended as indexes of the structures, roles, philosophies and sanctions referred to above, and were meant to be fairly typical of the kinds of things teachers might say to students. The transcripts were given to four judges[5] who were asked to assimilate as many as possible of the expressed and implicit attitudes of the teachers concerned. Judges were then asked to rank the 40 statements, regardless of whether positive or negative, in terms of how well those attitudes were reflected. Kendall's coefficient of concordance was calculated ($W = 0.52$) in order to provide a measure of the relation between judges' rankings.[6] However, five of the judges ranked four particular statements amongst their first eight choices and the other two judges ranked the same four statements amongst their first eleven choices. Furthermore, there was unanimity as to the positive or negative scoring for each of the four. In view of the high level of agreement on ranking and direction of scoring, and the expediency of administering a few items in a short space of time, it was decided to base The 'Things Teachers Say' Test on the four most strategic statements.

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[5] Research scholars in the Faculty of Education, Monash University.

2.4.2 Administration of The 'Things Teachers Say' Test

Students were asked to list on the test forms (Appendix 3) the names of the four teachers considered to be most important for the relevant groups or classes, and the subjects or areas of responsibility under the charge of those teachers. Taking each teacher in turn, students indicated their level of agreement or disagreement with the proposition that the teacher in question would be likely to say the kinds of things expressed in each statement. Student opinions were recorded on a five point Likert-type scale (Strongly Agree, Agree, Disagree, Strongly Disagree, Not Sure) for each statement.

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[6] Kendall's coefficient of concordance (W) is an expression of the average of Spearman rank correlation coefficients that would be obtained from calculating r_s for all possible pairs of rankings. See Kendall (1948) for a full statement of rationale or Siegel (1956) for a useful, brief explanation.

2.4.3 Scoring The 'Things Teachers Say' Test

For statements reflecting behavior that was considered by the judges to be Open, responses were scored 1, 2, 4, 5, 3, respectively; (Statements B and C) while for Statements considered to represent Traditional practices, responses were scored 5, 4, 2, 1, 3, respectively (Statements A and D).

Two points about rationale should be raised here. In the first place, it was assumed that the statements scored as directional opposites from each other represented different positions on some dimension underlying the test as a whole; specifically, that this dimension was Open and Traditional behavior of teachers as indexed by statements made to students. Secondly, it was assumed that after repeating the same four statements across different teachers, a total scale score could be established by adding together four separate scale scores. As there were four different teachers about whom the statements could be applied there is one sense in which the test can be thought of as comprising 16 items. An alternative argument is that a student's responses concerning four different teachers amount to four discrete tests which ought not to be added. The decision to work within an additive model eventually rested on the argument that the organisation and behavior of total groups was the main concern of the study and that although differences could be expected between any four teachers in charge of a group, it was their similarities that ought to be tapped for the purpose of classifying groups as Open or Traditional.

2.4.4 Reliability of The 'Things Teachers Say' Test

One hundred and seventy five students in second year at four high schools completed the 16 item test. Table 5.4 indicates percentages agreeing with opinion statements, Edwards t-scores and probabilities. Because the same items are repeated for four different teachers it is not surprising that a pattern emerges in which Statements A and D have similar percentages to each other and Statements B and C have similar percentages to each other. Agreement with Statements A and D indicated somewhat Traditional behavior while agreement with Statements B and C indicated more Open behavior on the part of teachers. Regardless of level of importance of teachers, as ascribed by students, the four statements were highly discriminating.

Split-halves reliability of the 16 item test was 0.58. However, this result, while it was of satisfactory magnitude was open to criticism because it was based on only one randomly generated split. The nature of the test, involving as it did four administrations of each item, could well have influenced the reliability coefficient; that is, there was some risk that the particular coefficient obtained could have been artificially high or low. Therefore, a second measure of reliability was taken.

Cronbach's alpha was calculated for this purpose because it comprises not one, but an average of all possible randomly generated split-halves reliability measures. A result of $\alpha_c = 0.53$ was obtained, confirming that the original split-halves reliability had been a reasonable result.[7]

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[7] It should be noted that there are conflicting schools of thought as to the most appropriate use of Cronbach's alpha. While some researchers use it as a reasonable alternative to assessing reliability through equivalent forms, others claim it is best used as a measure of internal validity.

TABLE 5.4

THE 'THINGS TEACHERS SAY' TEST

PERCENTAGES AGREEING WITH OPINION STATEMENTS

Item	Per cent popularity	Edwards t-score	Probability
First ranked teachers			
Statement A	68.87	10.09	.0001
Statement B	34.78	8.19	.0001
Statement C	45.57	9.70	.0001
Statement D	71.65	11.28	.0001
Second ranked teachers			
Statement A	77.91	7.02	.0001
Statement B	47.30	6.31	.0001
Statement C	53.39	7.85	.0001
Statement D	74.26	10.07	.0001
Third ranked teachers			
Statement A	76.35	7.15	.0001
Statement B	43.30	7.16	.0001
Statement C	46.78	5.96	.0001
Statement D	76.87	9.92	.0001
Fourth ranked teachers			
Statement A	77.04	7.30	.0001
Statement B	44.70	6.78	.0001
Statement C	48.35	8.29	.0001
Statement D	71.65	7.94	.0001

Statement A:	You will never learn anything if you do not sit quietly and listen to me.
Statement B:	I am more interested in you taking a while to understand your work than I am in making you hand it in on time.
Statement C:	You can ask me to work with you on this topic or you can even work out the answers with other children in the class.
Statement D:	If you do not pay attention you cannot expect to pass the examinations.

2.5 Validity of the Organisational Stringency Index and The 'Things Teachers Say' Test

Product moment correlation of the results obtained on these tests provided a useful indication of how valid each was as a measure of a dimension of Openness/Traditionalism. Using group means a result $r_{xy} = 0.85$ was obtained.

3. Analysis of Data Relating to Identification of Open and Traditional Groups

In order that performances on the various criterion tests could be compared between groups in such a way that prevailing differences would become evident, the best or most genuine Open and Traditional examples were required. Therefore, it was necessary to move beyond mere claims of Openness and Traditionalism by raters and school principals.

The Organisational Stringency Index and The 'Things Teachers Say' Test, as indexes of the educational practices and social structure of the groups, provided additional dimensions in defining groups as Open and Traditional. Groups were defined as Open for the purposes of this section of the study only if they were unanimously classified as such by raters, principals and by the results from these two indexes. The same procedure was used for groups claimed as Traditional.

Using group means, the results obtained on the Organisational Stringency Index and The 'Things Teachers Say' Test were split at the respective medians. Table 5.5 shows the allocation of groups to each category at first testing and Table 5.6 shows the allocation of groups eight months later at second testing. A visual display of these results can be seen in Figures 5.1 and 5.2. In the Organisational Stringency Index, higher mean scores indicated Openness and lower mean scores

Traditionalism. In The 'Things Teachers Say' Test, lower mean scores indicated Openness and higher mean scores Traditionalism.

TABLE 5.5

ALLOCATION OF GROUPS TO OPEN AND TRADITIONAL CATEGORIES ON THE BASIS OF CLAIMS, ORGANISATIONAL STRINGENCY INDEX AND THE 'THINGS TEACHERS SAY' TEST AT FIRST TESTING

Group	Claims	Organisational Stringency Index	The 'Things Teachers Say'Test
00	Open	Open (92.00)*	Open (51.58)*
01	Open	Open (90.38)	Open (44.63)
02	Open	Open (77.93)	Trad. (56.07)
03	Open	Open (100.52)	Open (44.39)
04	Open	Open (95.05)	Open (45.30)
05	Open	Open (74.97)	Open (52.73)
06	Open	Trad. (72.33)	Trad. (55.10)
07	Open	Trad. (73.74)	Open (53.56)
08	Open	Trad. (69.00)	Trad. (54.78)
09	Open	Open (77.90)	Open (50.20)
10	Trad.	Trad. (63.97)	Trad. (57.92)
11	Trad.	Trad. (70.97)	Open (52.33)
12	Trad.	Trad. (68.12)	Trad. (58.92)
13	Trad.	Open (86.97)	Open (53.59)
14	Trad.	Open (78.11)	Trad. (54.82)
15	Trad.	Trad. (64.39)	Trad. (56.77)
16	Trad.	Trad. (70.26)	Trad. (54.85)
17	Trad.	Trad. (67.15)	Trad. (57.11)
18	Trad.	Trad. (74.00)	Trad. (54.35)
19	Trad.	Open (82.54)	Open (52.62)

*Group means for this test.

TABLE 5.6

ALLOCATION OF GROUPS TO OPEN AND TRADITIONAL CATEGORIES ON THE BASIS OF CLAIMS, ORGANISATIONAL STRINGENCY INDEX AND THE 'THINGS TEACHERS SAY' TEST AT SECOND TESTING

Group	Claims	Organisational Stringency Index		The 'Things Teachers Say' Test	
00	Open	Open	(104.39)*	Open	(50.23)*
01	Open	Open	(85.67)	Open	(44.54)
02	Open	Open	(77.63)	Open	(54.52)
03	Open	Open	(106.24)	Open	(39.48)
04	Open	Open	(105.15)	Open	(44.45)
05	Open	Trad.	(69.20)	Trad.	(57.67)
06	Open	Trad.	(67.43)	Trad.	(58.93)
07	Open	Open	(73.22)	Trad.	(58.15)
08	Open	Trad.	(72.00)	Open	(51.52)
09	Open	Open	(75.37)	Open	(50.57)
10	Trad.	Trad.	(60.89)	Trad.	(56.97)
11	Trad.	Trad.	(59.83)	Open	(50.10)
12	Trad.	Trad.	(67.50)	Trad.	(57.54)
13	Trad.	Open	(77.81)	Trad.	(57.78)
14	Trad.	Trad.	(68.07)	Trad.	(56.61)
15	Trad.	Trad.	(65.65)	Trad.	(55.23)
16	Trad.	Trad.	(68.11)	Trad.	(54.81)
17	Trad.	Trad.	(68.52)	Trad.	(56.11)
18	Trad.	Open	(74.94)	Open	(53.16)
19	Trad.	Open	(81.85)	Open	(51.19)

*Group means for this test.

FIGURE 5.1

DISTRIBUTION OF GROUPS ON THE ORGANISATIONAL STRINGENCY INDEX AND THE 'THINGS TEACHERS SAY' TEST AT FIRST TESTING

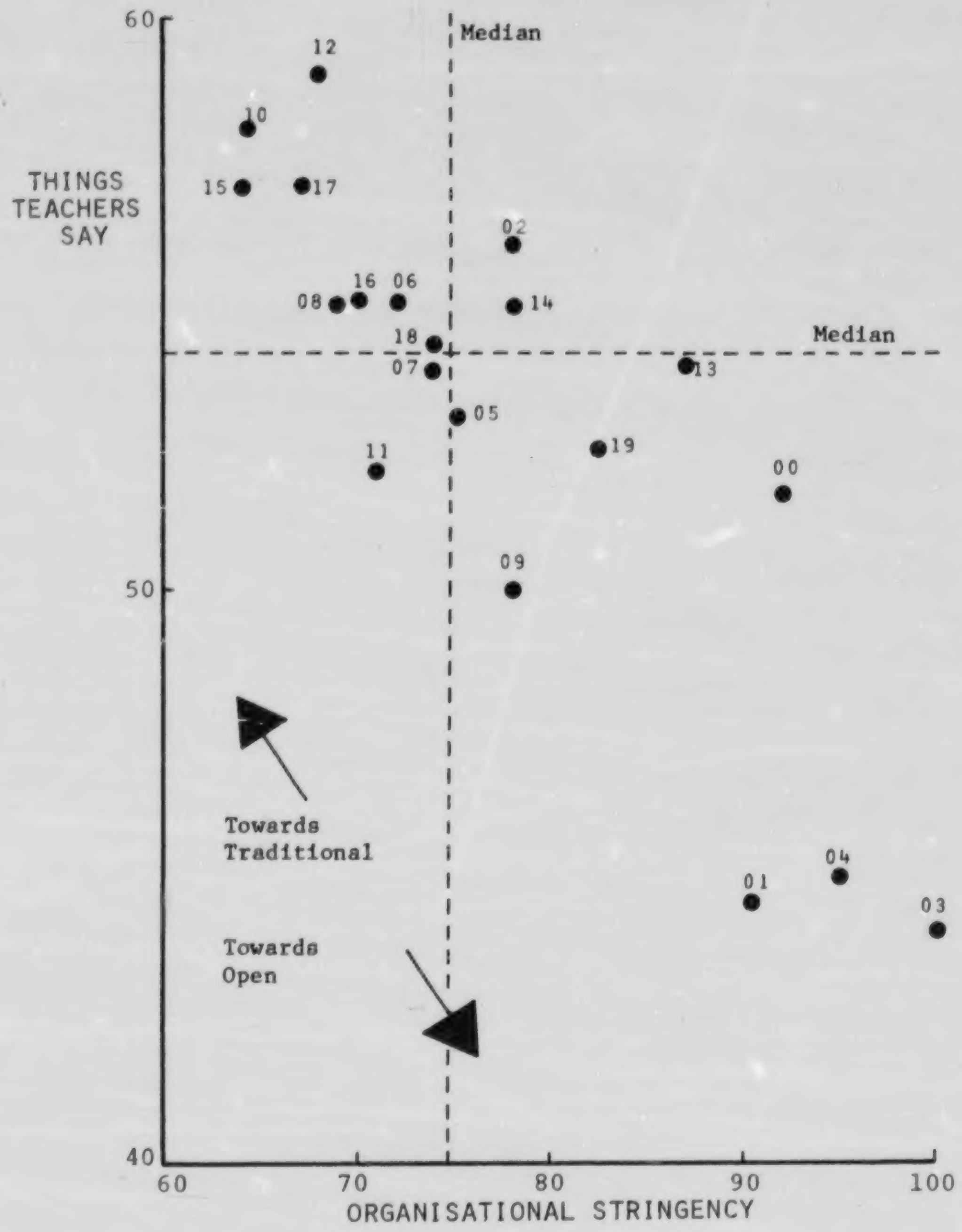
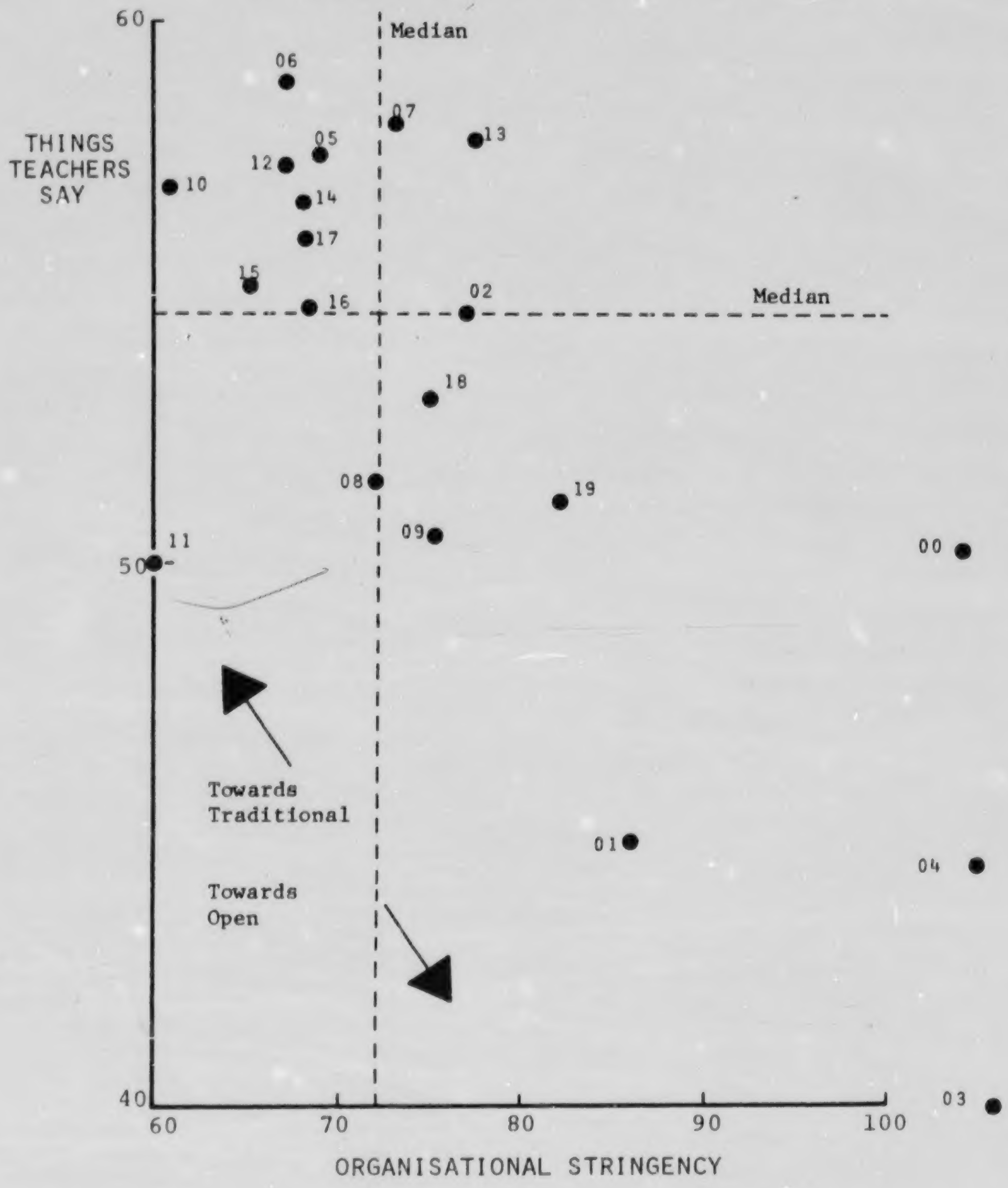


FIGURE 5.2

DISTRIBUTION OF GROUPS ON THE ORGANISATIONAL STRINGENCY INDEX AND THE 'THINGS TEACHERS SAY' TEST AT SECOND TESTING



Open groups were defined as those falling in the lower right quadrants of Figures 5.1 and 5.2 on both testings. Traditional groups were defined as those falling in the upper left quadrants of Figures 5.1 and 5.2 on both testings. Table 5.7 lists the groups so defined.

TABLE 5.7

GROUPS DEFINED AS OPEN AND TRADITIONAL

Groups defined as Open	Groups defined as Traditional
00	10
01	12
03	15
04	16
09	17

4. Summary

Four procedures were followed in order to identify Open and Traditional groups. Raters were asked to nominate 'best' examples of Open and Traditional groups at Form 1 level in Victorian high schools according to a five-point definition. Principals of the schools in which these groups occurred were asked to indicate their agreement or otherwise with the rater assessments. Students from the groups in which raters and principals reached agreement were then asked to complete two instruments, the Organisational Stringency Index and The 'Things Teachers Say' Test, both of which had already been assessed for reliability and validity. Subject to certain sampling constraints, groups were chosen for inclusion in the study on the basis of location in the appropriate Open and Traditional quadrants on both testing occasions in which results obtained from students were split at their respective medians.

CHAPTER 6

THE CRITERION MEASURES OF STUDENT ATTITUDES AND BEHAVIOR

Introduction

Two major problems were encountered in the selection of criterion measures. The first related to the disparate and somewhat vaguely stated aims of educational programs in both Open and Traditional groups. Criterion tests that attempted to measure the achievement of poorly formulated aims and about which there was not universal agreement anyway would obviously introduce unwanted sources of error. It became equally obvious however, that such error could not be entirely eliminated; on the one hand, it was necessary to use criterion tests that provided reasonable indexes of outcomes which the teachers thought desirable, while on the other hand tidy, but slightly invalid statistics were likely to result from criterion tests that probed highly specific skills and knowledge.

The second problem related to the possibility of very real differences existing between Open and Traditional teachers in terms of the educational outcomes each group felt were important. Unquestioning and uncritical obedience of students to teachers has often been highly valued in Traditional environments; in the Open environments it was not highly valued for most circumstances, and in several instances would have represented a failure by teachers to help their students to develop critical faculties and independence of thought. Certain kinds of social interaction seen as disruptive in Traditional groups were prized in Open groups suggesting that different assumptions were held in each case about learning processes.

This second problem can be re-phrased. To the extent that an innovation attempts to achieve different aims and/or processes from whatever it replaces, the researcher must either ignore those differences and compare and contrast the commonalities or, if he wants to measure characteristics valued differently by each of the two, he must favor one at the expense of doing some injustice to the other.

Four tests were used in order to probe curriculum outcomes; these concerned student attitudes to school, creative thinking, collaborative behavior of students and student preference for activities involving change or sameness, autonomy or dependence, and for intellectualised activities. The only special significance about the tests is that they were selected on the basis of outcomes commonly considered important by principals and teachers from a variety of schools visited when the feasibility of the present study was being assessed.

Provided the two main problems above are at least recognised there is no good reason why tests of other outcomes could not be used in subsequent studies in these schools.

1. Scale of Student Attitudes to High School

Two basic assumptions underpin the construction of this scale. The first is that attitudes can be important indicators of behavior. The second is that particular student attitudes to high school, if held in a positive direction, are in line with and supportive of the aims of the school and if held in a negative direction are inimical to those aims.

In respect of the first assumption, theorists have presented a variety of approaches. For example, Rosenberg (1956:367) defines attitude as a "relatively stable affective response to an object"; Allport (1935:810) defines it as "a mental and neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual's responses to all objects and situations with which it is related". Katz & Stotland (1959:428) refer to "a tendency or disposition to evaluate an object in a certain way". However, as Insko (1967:2) points out, the fact that recent definitions stress an evaluative dimension should not be taken to mean that "overt behavior is not a function of attitudes, however complex and devious the function may be".

In the present case, readiness to behave overtly on the basis of attitudes, and the tendency to do so are assumed - even admitting the possibility that for many attitudes, the route from attitude to overt behavior may be difficult to trace. Nevertheless, studies such as that by Musgrave & Reid (1971) in which values among students are inferred from several avenues of reported behavior, while approaching the problem the other way around, suggest that this is a reasonable assumption.

The second assumption rests on clinical information gained by the author in dealing with problem behavior in schools and from corroborative statements by teachers. It should be noted, however, that no attempt at value judgment is made here. That is, neither the aims of the schools nor the positive and negative attitudes of the students are treated as unalterably legitimate or illegitimate.

A third, less critical assumption should also be mentioned; that attitudes to school are generated largely from the experiences which the student confronts in the identifiable sub-groups in which he is a participant within the school. Murdock & Phelp (1972) for example, stress the need for much greater emphasis to be placed on the differential effects on children of a variety of youth cultures. Conversely, it can be assumed that the attitudes which the student holds towards school *in toto* are the proper concern of the staff members with whom he comes into contact in his sub-groups.

In the present study, 'attitude to school' is used as a generic term covering a number of propositions about teachers, studying, courses and the worth of education. The tendency for many teachers espousing Traditional Education to claim that positive student attitudes derived from 'tight' organisation, and for teachers in Open environments to claim that positive attitudes derived from less restrictive organisation in which the student could develop greater independence of thought and action, suggested that attitude to school constituted a valid area for consideration as a criterion measure. Evidence gathered in respect of this ussue becomes of special interest when account is taken of the Himmelweit & Swift (1969) argument that the definiteness of aim in a school can influence the extent of the socialising effects on students.

1.1 Construction of the scale of student attitudes to high school[1]

It was assumed that reactions of students to propositions about courses, studying, teachers and the worth of education would be continuously, but not necessary normally, distributed. At the positive extreme, one might expect consistent agreement with certain favorable propositions about the school and consistent rejection of certain unfavorable propositions. At the negative extreme, consistent rejection of favorable propositions and agreement with unfavorable propositions would be expected. The range between the extremes was termed the attitude continuum and it was asserted that individual student attitudes would fall somewhere on this continuum.

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[1] This scale was constructed and validated in collaboration with P.L. Gardner, Faculty of Education, Monash University, in 1970-71 in order to compare attitudes of students with academic performance.

A large number of opinion statements were written, or obtained with occasional modification from existing scales (Miller, 1934; Glassey, 1945; Weaver, 1959). These statements reflected positive and negative reactions to various aspects of school life and, from the complete list, 34 were selected for trial. One hundred and seventy seven students at third year level in two high schools were used as subjects. As with the Organisational Stringency Index, the procedure devised by Likert (1932) was adopted. Subjects responded on a five-point scale for each statement (Strongly Agree, Agree, Disagree, Strongly Disagree, Not Sure). Where a statement reflected a positive attitude to school the response was scored 5, 4, 2, 1, 3, for the respective five points; a statement that reflected a negative attitude to school was scored 1, 2, 4, 5, 3.

Eight statements proved very difficult to categorise as reflecting either positive or negative attitudes and were not scored. The 26 scored items were computer-analysed (Program ATTSCAN-5) to provide:

(a) total scores for each subject;

(b) the mean, standard deviation and split-halves reliability of the scores;

(c) the frequency distribution of scores;

(d) the item popularity of each statement;

(e) Edwards' t-values and their associated probability values for each statement; and

(f) the frequency counts of the various responses to each statement.[2]

Of the 26 statements used in the trial, three failed to reach the lowest acceptable t-value of 1.75 and were deleted. Of these three, one also had an item popularity of 90 per cent and was deleted as non-discriminating. A fourth statement with a relatively low Edwards' t-value of 2.80 was also deleted. The remaining 22 items were highly discriminating, all with t-values exceeding 3.50 and with probability values of less than .001.

1.2 Relaibility of the scale of student attitudes to high school

The split-halves reliability of the scale of 22 items was 0.88. Applying the Spearman-Brown correction, the reliability of the total scale was 0.94.

1.3 Student attitudes to high school as a valid hypothetical construct

It seems reasonable to assert that a common factor underpinned the responses because so many of the statements were highly discriminating. Further support for this assertion was gained by re-scoring the trial data using only the 22 items included in the final version. Differences between the trial schools had been noted before testing. One school was organised around an architecturally innovative design, used no ability-based or vocational groupings for instruction, encouraged continuous assessment procedures and involved students in school government. The other school was architecturally undistinguished, used vocational groupings, a fixed timetable and formal assessment, and did not consult students in matters of school government.

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[2] Details of rationale are given in Chapter 5, Section 2.3.1 above.

Table [illegible].1 analyses the scores for the two different schools and for the two different vocational tracks (professional and commercial) of one of the trial schools.

For present purposes the difference between the schools is the main point of interest; and the significant difference ($t = 7.25$; 175 df; $p < .001$) certainly helps to validate the scale. Of course, it would be improper to suggest what the most pertinent points of difference were on the basis of a validation trial. Physical facilities, grouping procedures or less obvious factors such as a Hawthorne effect (Roethlisberger and Dickson, 1939) in School X could have been important.

TABLE 6.1

FREQUENCY DISTRIBUTIONS OF TOTAL SCORES ON
THE SCALE OF STUDENT ATTITUDES TO HIGH SCHOOL

Scores	Verbal label	Frequencies			
		High School		High School Y	
		X	Y	Professional Track	Commercial Track
101-110)	highly positive	3	-	-	-
91-100)		18	-	-	-
81-90)	positive	29	15	9	6
71-80)		26	21	13	8
61-70	medial	12	18	6	12
51-60)	negative	4	18	6	12
41-80)		1	8	2	6
31-40)	highly negative	-	3	1	2
21-30)		-	1	-	1
	n	93	84	37	47
	$\overline{X}$	81.1	66.6	71.2	63.0
	σ	12.1	14.3		

2. Creative Thinking - The Consequences Task

During interviews to ascertain feasibility of the present study, teachers from a wide range of schools and across a spectrum of opinion referred to the fostering of creative thinking in students as a worthwhile educational goal. To what extent this expression was backed by conscious arrangement of curriculum content and method, it was not possible to judge.

Interestingly, the development of creative skills was one of the very few educational outcomes that some entrenched conservative teachers conceded might be achieved better in an Open group than in a Traditional group. Not surprisingly, teachers who claimed to work in Open groups or to support them in principle, also felt that the great 'freedom' of Open groups would foster creativity.

The note of agreement could not, however, be carried to the obvious next step: What is creativity? Teachers of various or even similar philosophical persuasions seemed unable to define what they meant by creativity. Terms such as 'shows originality', 'writes interesting essays', 'writes poetry', 'paints abstracts' and 'models fantastic things out of clay' were typical in teachers' comments. Perhaps many of these teachers still thought of creativity in terms of a few vague stereotypes because much of their own educational experience had focused on learning routines that constrained such activities. Whatever the reason, most teachers felt more confident of recognising creative behavior when they saw it than of conceptualising it.

In fairness, it should be said that psychologists and others who have made some attempts to specialise in the study of creative behavior have, more often than not, been cursed by similar difficulties. As Gilchrist (1972) has observed, "... Educational objectives such as fostering creative talent or developing the wholeness of the creative personality have frequently been advocated with more zeal than precision."

Until as recently as the 1950's, the major workers in the field of creativity (Francis Galton, J. McK. Cattell, Binet and Terman) emphasised genius, special abilities and superior intelligence. From about 1950, Guilford managed to change this emphasis when he proposed that creativity was distributed variously throughout the population, at the same time questioning the presumed relationship between creativity and high I.Q. (Guilford, 1950). His treatment of creativity as encompassing sensitivity to problems, fluency of ideas, flexibility of thinking in problem-solving, production of novel ideas and the analysis and synthesis of ideas (Gilchrist, 1972:5) has found direct and continued appeal amongst educationists.

Taft (1971) comes close to articulating what most of the teachers had tried to express; he locates two creative styles "... one a measured, problem-solving approach, and the other, an emotional, and comparatively uncontrolled, free expression." However, Taft treats these two styles as representing two linear dimensions which may overlap,[3] whereas Gilchrist (1972:83) treats them as extremes on a single continuum.

A most important corollary of the recent shift in theoretical perspectives on creativity is that of operationalising the concept for evaluation. In the earlier works where creativity was seen primarily as a function of superior intelligence (viz.: Cattell, Binet and Terman), testing procedures were centred on cognitive closure or convergence. The work of Guilford (1959), in constructing more open-ended criterion tests of creativity paved the way for the tapping of cognitive divergence and consequent synthesising activity.

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[3] Personal communication, March, 1973.

These tests, like those that followed from Getzels & Jackson (1962), Yamamoto (1964) and Torrance et al (1960) have encountered many difficulties when placed under the microscope of statistical validation procedures.

2.1 Validity of creativity testing

In any pure sense of the term, the validity of creativity tests must ultimately be judged on the power of those tests to predict creative talent or achievement assessed independently of test performance (Gilchrist, 1972). Yet they have proven relatively unconvincing under reasonable scrutiny; Jones (1964), Barron (1963) and MacKinnon (1961) report low to middle-range correlations.

In the present study, a choice had to be made, either to open up the very complex issues of validity and reliability and to deal with them fully, or to attenuate counter-arguments to their use by dealing with them in a simpler framwork.

In choosing the latter course of action, emphasis was shifted to a consideration of one test of divergent thinking in order to probe one educational goal acknowledged as worthwhile by Traditional-oriented teachers and actively pursued by Open-oriented teachers, that one goal being diversity in thinking about problems.

2.2 Rationale of the Consequences Task

An individual is confronted with an improbable situation and asked to predict outcomes from a variable previously unknown to him. If he is to make a productive response, he must 'play with' the possibility and imagine the things that might happen in consequence. As Torrance (1966) points out, this kind of thinking appears to be important in creative behavior; yet many individuals find great difficulty even in entertaining the possibilities and consider the tasks to be intolerable.

A variation on the basic rationale was introduced into the present study. Instead of using different Forms of the task for each of the two testing programs, it was decided to retain the items listed below, for both. The principal reason was that direct comparison could be made from one testing program to another about response patterns concerning a particular improbability. The risk that pre-test effects might bias the results obtained at second testing was accepted for two reasons; firstly, the time lapse of eight months between testing programs appeared sufficient to reduce pre-test effects, thereby making the risk minimal, and secondly, the advantages accruing from being able to compare Open group and Traditional group performance on specific items seemed to outweigh the low risk of bias.

The Consequences Task should be seen as a verbal task based on verbal stimuli. Originally, it was chosen by Guilford et al (1952) to yield measures of Ideational Fluency and Penetration. In modifying the Consequences Task, Torrance chose three improbable situations for each of two Forms A and B from an earlier established list of impossibilities. The three items of Form A of the Consequences Task were used in the present study, the items being:

1. What would happen if man could become invisible at will?
2. What would happen if a hole could be bored through the earth?
3. What would happen if the language of birds and animals could be understood by man?

Form A was also chosen in preference to Form B because it had already been in wide use with children whereas Form B had been used mainly with adults.

2.3 Administration of the Consequences Task

The Consequences Task was administered as a paper and pencil group test. As suggested by Torrance, a five minute time limit was allowed for responding to the three items.

2.4 Scoring of the Consequences Task

The basic design is meant to reveal an individual's ability to formulate hypotheses concerning cause and effect (Torrance, 1966). The number of relevant responses produced by an individual yields one measure of ideational fluency. The number of shifts in thinking or number of different categories of consequence gives a measure of flexibility. The extent to which a response represents a mental leap or departure from the obvious or commonplace gives a measure of originality. The amount of detail and specificity in a response provides a measure of elaboration.

2.5 Reliability of the Consequences Task

Two aspects of reliability were considered. The first concerned the general reliability that could be assumed for a given score. Because a scorer was required to make a professional (almost clinical) judgment as to whether a set of responses demonstrated Ideational Fluency, Penetration, Flexibility and Originality, it was possible that variations between scorers could arise in the translation of responses into concepts. Fifty sample responses were scored by two judges,[4] and a product - moment correlation coefficient calculated. As $r_{xy} = .90$ it was assumed that only a very low error factor would be introduced into the results because of the almost clinical nature of the test.

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[4] Psychologists with the Victorian Education Department.

The second aspect of reliability was concerned with the ability of the test to produce a stable result from a respondent, given no change in that respondent's creative prowess. To some extent, the works of Torrance & Dauw (1965) and Runner & Runner (1965), drawn together by Torrance (1966) imply predictive reliability for the Torrance Tests of Creative Thinking as a whole. However, such studies could hardly be claimed as convincing evidence of stability of one part of the Verbal section of the Torrance tests. For present purposes Forms A and B were administered a week apart to a small group of students.[5] Total scores for each student on Form A were correlated with those on Form B, giving $r_{xy} = .78$. This coefficient was probably lowered artificially because the 'unknown' concepts could not be equated exactly.

2.6 Validity of the Consequences Task

In the discussion above on the validity of creativity tests, doubts were expressed about the extent to which such tests served as predictors of subsequent creative activity. In the present context no more was claimed for the Consequences Task than that it should provide a measure of divergent thinking which, it could be assumed, would be related in some way to creativity. The major issue of the validity of creativity tests having been sidestepped, one other possible source of error in obtaining validity remained; namely, the fact that the Consequences Task was used as a paper and pencil test. It could be argued that the test's failure to use other than a verbally based, written mode of expression condensed into a five minute time limit, was a limitation, especially in a field such as divergent thinking.

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[5] Form B asks:

1. What would happen if our days were twice as long as they are?
2. What would happen if a man could live forever on the earth?
3. What would happen if men could fly without mechanical aids?

In view of the relatively short time available for data collection in each testing program there was little that could be done about these unwanted sources of error other than to acknowledge their existence and moderate any subsequent findings accordingly.

3. The Collaborative Behavior Profile

The criticism is often made about Traditional Education that one mode of transmitting knowledge and experience, the chalk-and-talk lesson, is relied upon so much and so inappropriately that the learning processes of students may be seriously impaired. Many critics of Traditional Education claim that Open Education involves far less reliance on one mode of transmission and more reliance on a variety of lectures, small group tutorials, privately conducted research and experimentation, individual instruction and standard lessons, as appropriate. The tempting question of appropriateness cannot be argued here, however. The main issue is that a fundamental assumption about learning is at stake. In its more extreme forms, Traditional Education emphasises learning through teaching; by pre-digesting a body of knowledge into a syllabus and regurgitating a logical, integrated set of steps for consumption by students. In this model, the essence of school organisation is to treat students as pedagogically isolated units, a strategy made necessary because expediencies of teaching tend to outweigh fundamental principles of learning. Consequently, so the argument goes, learning is impaired unless silence is maintained and collaboration between students and school sessions is strictly governed. Less extreme forms of Traditional Education appear to follow the same basic pattern, but less obviously so.

Proponents of Open Education claim to operate with students' learning and experience uppermost in mind. The assumption here seems to be that learning is most likely to occur when motivation is at a high level; and motivation, in its turn, is likely to improve when learners collaborate often in the task of drawing together information from a variety of sources and integrating that information themselves. To outside observers these programs may seem disorganised at first view, only marginally relevant to formal learning and rather devoid of conventional syllabus logic.

In essence, then, Traditional Education assumes that learning occurs when the teacher teaches and when a rule system is invoked that establishes silence, attention and control. On the other hand, while not denying the need for these strategies on certain occasions, most forms of Open Education assume that interaction between students is motivating, can be highly productive, and is a worthwhile socialising experience.

One further introductory point relates to the tendency for those involved in Traditional Education to draw fairly clear distinctions between work-based interactions and irrelevant interactions; irrelevant, that is, to the legitimated task of the moment. In Open Education groups most, if not all interactions are deemed relevant even when they are not work-based to any great extent, primarily because processes therein are treated as valid educational aims in their own right. However, these processes are also seen to have educational significance in the sense that the potential output of learners working in collaboration is assumed to be greater than the potential output of one learner working in isolation. Re-phrased, this means that a given learner may use other learners as additional, if not centrally important learning resources.

3.1 Construction of the Collaborative Behavior Profile

The Collaborative Behavior Profile was developed as a variation of the semantic differential scales commonly used in attitude measurement (Osgood & Tannenbaum, 1955). Ideas expressed by teachers during interviews in the feasibility stage of the present study were compressed into six categories. For each category, two sentences were chosen to indicate boundaries of the domain of discourse within which raters were to respond, the first sentence in each case representing an intended outcome of Open Education (although the second sentences should not be assumed as intended outcomes of Traditional Education). All six categories were associated with the underlying assertion that collaborative behavior, a concept to which these categories contributed, was an intended outcome of Open Education.

Nine-point scales were placed between each pair of the following sentences:

(1) The students very much enjoyed that session of school: The students very much disliked that session of school.

(2) The students were very much involved in the legitimate activities of the session: The students were not involved with the legitimate activities of the session.

(3) Teacher(s) approved of communication that operated without immediate teacher control: Communication between students was disapproved or rigorously controlled.

(4) Communication between students was 'work-positive': Communication between students was 'work-negative'.

(5) Students used the teacher(s) as a resource (active student takes issues to passive but available teacher): Students did not use the teacher(s) as a resource (active teacher dominates student access to issues).

(6) Students were encouraged to research and discover for themselves (particular information was secondary to research activity): Students were not encouraged to research and discover (sheer transmission of particular information was of primary importance).

The parenthetical sections in items (5) and (6) were included as cues to direct the attention of raters to particular and important examples of these general categories of behavior.

3.2 Scoring the Collaborative Behavior Profile

The Collaborative Behavior Profile was scored in two stages. In the first stage, judges assessed behavior with reference to each of the six dimensions and rated the observed behavior from 0 points through

8 points for the negative and positive extremes respectively. In the second stage, each profile was reduced to a single number for statistical analysis by adding together the six separate scores.

3.3 Validity of the Collaborative Behavior Profile

Two observers were asked to use the Profile in rating four group sessions of second year high school students. From each group two subgroups of four students were interviewed as to their perceptions of the sessions in which they had just participated. After those loosely structured interviews two new observers were asked to rate the four group sessions on the Profile, using the student interview tapes as their reference. The associated correlation coefficient was 0.72, suggesting that the students' perceptions of events were fairly much in agreement with the original observers when allowance was made for the fact that the second group of observers was twice removed from the events being studied.

The Profile appeared to reveal valid information about collaborative behavior which the groups themselves considered important.

3.4 Reliability of the Collaborative Behavior Profile and inter-rater reliability

Inter-rater reliability for the Profile as used in Section 3.3 above was 0.70. However, one problem that must be acknowledged in establishing reliability in the Profile concerns the selection of school sessions for sampling purposes. If a group of students and associated teachers are constantly engaged in one kind of interaction, one kind of teaching style and one set of assumptions about learning, there is no particular problem. But if several kinds of interactions, teaching styles and learning assumptions exist, then ideally the sampling procedure should be complicated accordingly.

Because of considerations of time, sampling of the complete range of school sessions could not be undertaken and reliance was placed on a request to schools to nominate the sessions that were felt to be most typical for the groups concerned. While the greatest possible care was taken to ensure that the profile was applied fairly, questions can be asked legitimately as to whether the coverage in the present study was extensive enough. Case study data tended to support the view that coverage was reasonably adequate.

4. The Preferred Activities Index

The personal interests, preferred activities and attitudes to certain lifestyles expressed by individuals may be related, in varying degrees, to the organisations in which they spend their time and energies. Some organisations deliberately foster the development of particular attitudes, interests and activities as a desired outcome of organisational functioning. Although its goals and objectives are very often difficult to grasp and may be shrouded in trite or vague language, the school is just such an organisation. The school may induce in its students a wide range of affective responses extending from highly generalised political and social attitudes to quite specific ideas about the most logical and best way to tackle a problem.

At the time of the feasibility discussions teachers in Open and Traditional groups differed from each other in the extent to which they valued the development of certain affective responses in their students. In particular, teachers in Open groups frequently referred to the need to prepare students for a world in which rapid technological and social changes would be permanent features. Positive student attitudes towards change, towards autonomous or independent thought and action, and towards intellectual activity were considered important to this end.

The idea behind the Preferred Activities Index can be expressed in similar terms to those used by Murray (1938) and Stern (1970). Both of these writers have viewed human behavior as being generated by needs emanating from within the individual and by environmental presses emanating from sources external to the individual. Actual behavior, presumably, is the result of compromises between needs and presses. A further assumption can be suggested, that needs are constantly adjusted by deliberate or unwitting intervention from such sources of environmental press as other people. That is, while it may be accepted that needs are characterised by a certain degree of stability or constancy, they are constantly changed in marginal ways and occasionally changed in substantial ways.

In the present study, it was important to know whether experiences gained by students in Open groups were associated with particular attitudes any more than was the case with experiences gained by students in Traditional groups.

Incidentally, it should be noted that there was no real contradiction involved in the attempts of Open Education teachers to develop in their students positive attitudes towards autonomy and their attempts to develop a collaborative, interactive environment. In fact, it was generally believed that student contributions to an interactive work environment would be enhanced if individual students could think and act independently and create what is sometimes referred to as genuine dialogue.

4.1 Construction of the Preferred Activities Index

Constructing an instrument that could be used to assess relevant needs involved decisions at two levels. In the first place, an economical and effective technique for probing needs was required; the possibilities include rater observation, autobiographical data, projective tests and interviews. Secondly, it was necessary to decide whether a respondent should be enabled to choose needs which *he* considered important or whether he should be constrained in some way. The consequence of a respondent defining and discussing self-selected needs would be to create complications of comparison between respondents as well as to create problems of directional intensity of responses.

Because teachers in Open groups placed high value on particular dispositions, and for reasons of economy as well, it was decided that the needs to be investigated should be pre-determined by the researcher so that a respondent had only to choose the direction and intensity of his preference. Furthermore, it appeared that a preference inventory would prove both a simple and an efficient probing technique in which respondents could agree or disagree in varying degrees to opinion statements based on particular needs.

The Stern (1970) Activities Index provided a useful base from which to work, three of the 30 scales built into that Index closely approximating the suggestions of teachers. The three scales were the Change-Sameness scale, the Supplication-Autonomy scale and the Understanding scale. The main problem in applying the Stern scales directly was that many items were written for comprehension and language levels of senior high school students or of college students, whereas the present study concerned first year high school students. Many of the Stern items were re-worded or replaced by parallel items that retained the original sense and substance. As in the Stern Activities Index, each scale comprised ten items and, essentially, the validity of each scale was retained: the Change-Sameness scale dealt with preference for "... variable or flexible behavior versus repetition and routine"; the Autonomy-Dependence scale, as it is re-named in the present study, dealt with preferences for "... dependence on others for love, assistance and protection versus detachment, independence and self-reliance"; and the Understanding scale (re-named Intellectualised) dealt with preference for "... detached intellectualization, problem-solving analysis, theorising, or abstraction as ends in themselves" (Stern, 1970:315-317).

In the actual test form, the 30 items of the Index were listed randomly, each item being expressed as an "I like ..." statement.

4.2 Scoring of the Preferred Activities Index

Again the procedure devised by Likert (1932) was adopted. Subjects responded to each statement by indicating their level of agreement or disagreement with it. Responses were recorded on a five-point scale (Strongly Agree, Agree, Disagree, Strongly Disagree, Not Sure) and were scored 1, 2, 3, 4 and 5 respectively for items lying positive to scale (i.e., reflecting preference for Chance, Autonomy, Understanding) and 5, 4, 3, 2 and 1 for items lying negative to scale (i.e., reflecting preference for Sameness and Dependence, and non-preference for Understanding).

Responses from individuals were computer-analysed (Program ATTSCAN-5) in relation to each of the three scales to provide:

(a) total scores obtained by each subject;

(b) the mean, standard deviation and split-half reliability of the scores;

(c) the frequency distribution of scores;

(d) the item popularity of each statement;

(e) the Edwards' t-value and associated probability level for each statement; and

(f) frequency counts of the responses to each statement.

Apart from differences due to item reconstruction the Preferred Activities Index differs from Stern's Activities Index in actual method of scoring, the latter allowing only two possible responses - True/False, Accept/Reject, or Like/Dislike, whichever is appropriate. As early as 1953, the Undecided response alternative was omitted from the Stern Activities Index on the claim that a simple two-choice format yielded essentially similar results with marked savings in processing time (Stern, 1970:13). During the non-statistical part of the evaluation procedures arranged in respect of the Preferred Activities Index to be used in the present study, however, a considerable degree of antipathy was expressed by respondents towards a two-choice format. While it is not suggested that such feelings would necessarily lead to distorted response patterns, the mere fact that the Index could be completed without undue irritation seemed a worthwhile gain in itself. Furthermore, the fact that testing sessions were to be separated by only eight or nine months suggested that a change in activity preferences (likely to be a reasonably stable feature of personality organisation) might occur in a respondent, without that respondent altering the direction of his preference. That is, a respondent may have wished to alter the intensity of his preference without altering its direction from, say, the Agree categories to the Disagree categories; and this variation in intensity may have been psychologically significant.

4.3 Validity of the Preferred Activities Index

Stern (1970) has distinguished between validation by equivalence (i.e., where one appraisal is in agreement with other appraisals) and validation by consequence (i.e., where consequent behavior predicted by the appraiser actually occurs). In the case of equivalent validity, Stern offers mixed evidence for his Activities Index as a whole (30 scales x 10 items each) although, on balance, that evidence is supportive. Both Scanlon (1958) and Stern, Ross and Braen[6] provide direct support, the former through a technique of comparing Activities Index profiles with classmates ratings of personality characteristics, and the latter through a double-blind analysis involving parents and the psychiatrist of six children under therapy. On the other hand, Mueller (1962 a) produced equivocal results in a design similar to Scanlon's design and subsequently suggested that successful validation by judges was dependent upon how insightful were both judges and respondents (Mueller, 1962 b).

In the case of consequent validity Stern has reported a variety of evidence ranging from studies done with teachers (Masling & Stern, 1966; Myers, 1962, 1963 a, 1963 b; Wassertheil, 1955; Mueller, 1966) to a case study of a college student (Stern, 1970) the general tenor of which is supportive.

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[6] Reported in Stern (1970:185).

In the present study, only three of the Stern scales were required, with suitable alterations in phrasing. A double-blind analysis was used as a supplementary validation procedure, involving a school psychologist and four children receiving attention as school refusal cases. While this validation procedure resulted in uniformly successful identification, as occurred with Stern, Ross and Braen (Stern, 1970), some reservations were felt to the effect that success was likely to depend largely upon the existence of clear cut differences between the selected cases. The more extreme the personalities involved, the easier the analysis.

TABLE 6.2

PREFERRED ACTIVITIES INDEX (CHANGE/SAMENESS) PERCENTAGES AGREEING WITH OPINION STATEMENT

Item	Percentage in Agreement			Edwards T	P
	Schl X	Schl Y	Overall		
2. I like changing my interests.	56.25	50.79	53.54	3.25	.0010
3. I like working out new ways to answer questions in tests of schoolwork.	48.44	55.56	51.97	5.01	.0001
6. I like doing things at regular times.	17.19	26.98	22.05	1.81	.0500
10. I like to make sure I don't change too much as a person.	39.06	41.27	40.16	3.31	.0010
14. I like doing things a different way every time.	70.31	42.86	56.69	4.98	.0001
17. I like staying in the same circle of friends all of the time.	23.44	42.86	33.07	4.21	.0001
23. I like being the same as I am.	7.81	34.92	21.26	5.01	.0001
24. I like the idea of moving to new places to live.	18.75	36.51	27.56	4.47	.0001
26. I like changing my opinions.	45.31	41.27	43.31	5.86	.0001
29. I like eating the same kinds of foods because I know what to expect.	43.75	61.90	52.76	6.21	.0001

TABLE 6.3

PREFERRED ACTIVITIES INDEX (AUTONOMY/DEPENDENCE) PERCENTAGES AGREEING WITH OPINION STATEMENTS

Item	Percentage in Agreement			Edwards T	P
	Schl X	Schl Y	Overall		
4. I like being an independent person.	67.10	76.19	71.65	3.62	.0010
5. I like teachers who tell me how to do things.	42.19	39.68	40.94	8.54	.0001
8. I like talking about my problems with the family.	39.06	53.97	46.46	6.93	.0001
9. I like to be looked after.	42.19	65.08	53.54	6.34	.0001
11. I like listening to other people before I make a decision.	15.63	25.40	20.47	5.17	.0001
18. I like being told what to do.	73.44	90.48	81.89	6.56	.0001
19. I like being left alone to work out my personal problems.	70.38	57.14	63.78	2.67	.0100
21. I like having someone around who can help when I'm in trouble.	15.63	23.81	19.69	6.72	.0001
22. I like keeping my worries to myself.	56.25	39.68	48.03	5.05	.0001
30. I like having other people decide whether I should do something.	76.56	85.71	81.10	3.38	.0010

TABLE 6.4

PREFERRED ACTIVITIES INDEX (INTELLECTUALISED) PERCENTAGES AGREEING WITH OPINION STATEMENTS

Item	Percentage in Agreement			Edwards T	P
	Schl X	Schl Y	Overall		
1. I like listening to an expert explain his ideas.	67.19	58.73	62.99	4.45	.0001
7. I like thinking about difficult problems.	54.69	49.21	51.97	10.93	.0001
12. I like working out an answer even though I don't know how to apply it.	54.69	46.03	50.39	7.08	.0001
13. I like solving puzzles.	82.81	74.60	78.74	4.79	.0001
15. I like working out why everything happens.	71.88	53.97	62.99	9.67	.0001
16. I like talking about things without having to think too hard.	28.13	36.51	32.28	3.26	.0010
20. I like just sitting and thinking.	56.25	53.97	55.12	4.19	.0001
25. I like being a real thinker.	62.50	52.38	57.48	6.62	.0001
27. I like asking a lot of questions.	60.94	61.90	61.42	3.73	.0001
28. I like working on a problem at school even though I know the teacher won't put a question about it on the exam.	56.25	46.03	51.18	8.63	.0001

4.4 Reliability of the Preferred Activities Index

Stern (1970) offers quite adequate test-retest reliability data both for the Activities Index as a whole and for each of the 30 scales separately. By means of gamma (a measure of association based on cross-classification) the average per cent agreement in response patterns was obtained for the items of each scale. For each scale the gamma value was significantly greater than zero ($p < .01$) in all re-tests taken from one week to eight week intervals.

In the case of the Preferred Activities Index a test-retest reliability measure also using gamma (Goodman & Kruskal, 1954) was calculated. A coefficient of 0.70 ($N = 30$; $p < .01$) was obtained, being slightly lower than Stern's finding for the same re-test period (gamma = 0.73 after two weeks interval). Slight differences could be expected in reliability coefficients anyway, because the Stern Activities Index had used a response format allowing one of two choices, while the Preferred Activities Index allowed a choice from five responses including a Not Sure category.

Although no measure of response distortion was taken in the present study, Stern has reported that the Activities Index is not particularly susceptible to distortions through social desirability, faking or projection (Stern 1970:28-31).

However, two further considerations lend specific support to the reliability of the Preferred Activities Index. The first is that consistently significant probabilities were associated with the Edwards' t-values obtained in Tables 6.2, 6.3 and 6.4 above, suggesting high scale reliability and the presence of some underlying process in each scale. The second is that Stern has reported Kuder-Richardson reliability coefficients for the three Activities Index scales on which the Preferred Activities Index is based, ranging from 0.57 to 0.67 for the Change/Sameness scale, 0.56 to 0.68 for the Supplication/Autonomy scale and 0.70 to 0.75 for the Understanding scale (Stern, 1970:24).

5. Summary

Four criterion measures were either chosen or devised by which relevant aspects of student attitudes and behavior could be assessed. These measures comprised the Scale of Student Attitudes to High School, the Consequences Task (one of the Torrance tests of creative thinking), the Collaborative Behavior Profile, and the Preferred Activities Index (based on the Stern sub-scales of Change/Sameness, Autonomy/Supplication and Understanding). In each case, satisfactory information was obtained about validity and reliability.

The particular measures were chosen in preference to other measures, firstly because they represented contentious areas of possible difference in student outcomes between Open and Traditional groups, and secondly because they were considered to give reasonable coverage without favoring heavily either Open or Traditional groups.

CHAPTER 7

RESEARCH HYPOTHESES

Introduction

The hypotheses in this chapter fall into two categories. The first category relates to the likelihood (or lack of it) that differences will exist, on a number of criterion measures, between the extreme groups of three dichotomised variables. The criterion measures concerned attitudes to high school, creative thinking, collaborative behavior and three aspects of preferred activities. The dichotomised variables are the Openness or Traditionalism of educational environments, the Metropolitan or Rural location of the schools, and the Large and Small size of the schools in which the educational environments are located. Because two separate testing sessions were conducted, it was possible to investigate the likelihood of differences on these variables approximately six weeks into the school year and again after ten months of the school year had elapsed.

The second category of hypotheses is based on an assumption that students were distributed randomly in terms of the criterion measures, through each of the main variables in the study at the commencement of the school year. That is, the actual placement of students in one or other educational environment was coincidental with factors other than performance on the criterion measures. Expressed another way, we might say that, although there was no researcher control over the random allocation of students to the various educational environments, the actual allocation of students was as though random. The aim in this second category of hypotheses is to investigate the likelihood of differential changes in performance on the criterion measures having occurred between the extreme groups on each main variable.

1. A Note on Null and Directional Hypotheses

Flanagan (1958) has distinguished between the formulation of hypotheses on the basis of decision theory on the one hand and conclusion theory on the other hand. McCulloch (1967) develops this position thus:

> "Decision procedures distinguish between the effect of two hypotheses so that the risks may be minimized, in taking action, it being known all along that action will be taken; while conclusion procedures are concerned with evaluating the adequacy of evidence on the basis of which some conclusion may be reached or, if the evidence is deemed inadequate, deferred." (McCulloch, 1967:112)

This issue finally devolves around the relative degree of risk entailed by the researcher in judging the consequences of rejecting or accepting hypotheses or in locating rational alternative hypotheses. It is this kind of relative risk which determines whether a researcher will concentrate on fixing an alpha or a beta level in his hypothesis testing (see Chapter 8, Section 1, below).

Following this point, it can be suggested that the convention of uncritically formulating all hypotheses in null form incorporates considerable potential danger because it conceals the hunches which motivated the researcher to gather the evidence in question in the way that he did and, furthermore, distorts reality by a spurious claim to objectivity in decision-making. Savage (1954), Edwards (1956) and McCulloch (1967) all attend to one aspect or other of this problem.

The crux of the foregoing discussion is to indicate that the setting of null hypotheses (at the theoretical level as distinct from their use in the calculations for a particular statistical test) should derive from as logically defensible an argument as should the setting of directional hypotheses. In the present study, all hypotheses are null hypotheses because of the dialectic emanating from protagonists and antagonists about each position. In the case of Open and Traditional groups, the 'opposing' sides offered contentions of three kinds each of which the researcher had no reason to believe could be denied. The three contentions were:

(a) that Open Education environments will make a difference (for the better) in the way a student performs on the criterion measures;

(b) that Open Education environments are, in effect, no different from any other kind of educational environment; and

(c) that Open Education environments will actively harm and retard student performance.

With regard to the other variables of Metropolitan or Rural location and Large and Small size of school, null hypotheses were also formulated. Features of size and location were claimed by many teachers to be possible alternative explanations to the Openness/Traditionalism explanation; however, because these variables were included for exploratory purposes and because the researcher could not find sufficient worthwhile evidence to hypothesize that Metropolitan students should perform better or differently from rural students, and so on, null hypotheses were appropriate.

The formulation of null hypotheses throughout this chapter will not, however, be taken to imply that one or more alternative hypotheses must be accepted should the former be rejected. The position maintained in this study, because of the obvious multivariate nature of the work and its exploratory character, is that put forward by Wald (1950), Savage (1954), Schlaifer (1959) and McCulloch (1967) wherein the decision problem is seen in the final analysis as a trichotomy rather than a dichotomy. That is, the decision can be that the statistical hypothesis is accepted or rejected or that sampling must be continued:

> "If a dichotomy in decision making is insisted upon, the situation could well give rise to what Levy (1966) calls 'the error of obtaining exact answers to stupid questions'. On the other hand, if a trichotomous decision is accepted the possibility arises of getting very loose and experimentally inconclusive answers to questions whose seriousness is not in doubt." (McCulloch, 1967:116)

The procedure is that hypotheses will be reported as having been accepted or rejected in the summary of results while the third decision will be reserved for the detailed discussion of results.

2. Hypotheses Relating to the First Testing Program

Hypothesis 1.1 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Attitudes to High School.

Hypothesis 1.2 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Creative Thinking.

Hypothesis 1.3 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Collaborative Behavior.

Hypothesis 1.4 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 1.5 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 1.6 There is no significant difference after six weeks, between Open and Traditional Education groups with respect to Preferred Activities that involve Intellectual output.

Hypothesis 2.1 There is no significant difference after six weeks, between groups of students from Metropolitan and Rural schools with respect to Attitudes to High School.

Hypothesis 2.2 There is no significant difference after six weeks, between groups of students from Metropolitan and Rural schools with respect to Creative Thinking.

Hypothesis 2.3 There is no significant difference after six weeks, between groups of students from Metropolitan and Rural schools with respect to Collaborative Behavior.

Hypothesis 2.4 There is no significant difference after six weeks, between groups of students from Metropolitan and

Rural schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 2.5 There is no significant difference after six weeks, between groups of students from Metropolitan and Rural schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 2.6 There is no significant difference after six weeks, between groups of students from Metropolitan and Rural schools with respect to Preferred Activities that involve Intellectual output.

Hypothesis 3.1 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Attitudes to High School.

Hypothesis 3.2 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Creative Thinking.

Hypothesis 3.3 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Collaborative Behavior.

Hypothesis 3.4 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 3.5 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 3.6 There is no significant difference after six weeks, between groups of students from Large and Small schools with respect to Preferred Activities that involve Intellectual output.

3. Hypotheses Relating to the Second Testing Program

Hypothesis 4.1 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Attitudes to High School.

Hypothesis 4.2 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Creative Thinking.

Hypothesis 4.3 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Collaborative Behavior.

Hypothesis 4.4 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 4.5 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 4.6 There is no significant difference after ten months, between Open and Traditional Education groups with respect to Preferred Activities that involve Intellectual output.

Hypothesis 5.1 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Attitudes to High School.

Hypothesis 5.2 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Creative Thinking.

Hypothesis 5.3 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Collaborative Behavior.

Hypothesis 5.4 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 5.5 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 5.6 There is no significant difference after ten months, between groups of students from Metropolitan and Rural schools with respect to Preferred Activities that involve Intellectual output.

Hypothesis 6.1 There is no significant difference after ten months, between groups of students from Large and Small schools with respect to Attitudes to High School.

Hypothesis 6.2 There is no significant difference after ten months, between groups of students from Large and Small high schools with respect to Creative Thinking.

Hypothesis 6.3 There is no significant difference after ten months, between groups of students from Large and Small schools with respect to Collaborative Behavior.

Hypothesis 6.4 There is no significant difference after ten months, between groups of students from Large and Small schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 6.5 There is no significant difference after ten months, between groups of students from Large and Small schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 6.6 There is no significant difference after ten months, between groups of students from Large and Small schools with respect to Preferred Activities that involve Intellectual output.

4. Hypotheses Relating to Changes Between Six Weeks and Ten Months

Hypothesis 7.1 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Attitudes to High School.

Hypothesis 7.2 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Creative Thinking.

Hypothesis 7.3 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Collaborative Behavior.

Hypothesis 7.4 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 7.5 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 7.6 There is no significant change from six weeks to ten months between Open and Traditional Education groups with respect to Preferred Activities that involve Intellectual output.

Hypothesis 8.1 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Attitudes to High School.

Hypothesis 8.2 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Creative Thinking.

Hypothesis 8.3 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Collaborative Behavior.

Hypothesis 8.4 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 8.5 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 8.6 There is no significant change from six weeks to ten months between groups of students in Metropolitan and Rural schools with respect to Preferred Activities that involve Intellectual output.

Hypothesis 9.1 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Attitudes to High School.

Hypothesis 9.2 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Creative Thinking.

Hypothesis 9.3 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Collaborative Behavior.

Hypothesis 9.4 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Preferred Activities that involve Change or Sameness.

Hypothesis 9.5 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Preferred Activities that involve Autonomy or Dependence.

Hypothesis 9.6 There is no significant change from six weeks to ten months between groups of students in Large and Small schools with respect to Preferred Activities that involve Intellectual output.

CHAPTER 8

STATISTICAL SUMMARY

Introduction

This chapter has two purposes. The first is to tabulate the data obtained on the four criterion measures of Student Attitudes to High School, Creative Thinking, Collaborative Behavior and Preferred Activities (three sections). These results are summarised across each of the main sets of variables, Open and Traditional Education Environment groups, Metropolitan and Rural location of groups and Large and Small size of schools in which groups occurred. Tables 8.1 to 8.12 inclusive show the means, standard deviations and standard errors for the groups combined into the above sets of variables. Tables 8.13 to 8.30 inclusive show the relevant correlations, unadjusted and adjusted criterion means and F-values for the analysis of covariance calculations (ANCOVA F-values).

The second purpose is to test the hypotheses detailed in the previous chapter so that differences between, and changes over time in the various groups can be identified. Figures 8.1 to 8.18 inclusive summarise the results of the hypothesis-testing procedure. Each figure is comprised of a graphical portrayal of the results, the t-value and decision relating to the comparison after six weeks, the t-value and decision relating to the comparison after ten months, and the ANCOVA F-value and decision concerning the relative changes occurring between six weeks and ten months elapsed time.

The main problem arising from the graphical portrayal of results is that the scaling strategy determines whether points and gradients plotted actually look significantly different from other points and gradients. This problem has been largely overcome by the use of standard error bars around each plotted point; hence, points can be plotted to make maximum use of the area of the graph but significant difference or otherwise should be judged visually by the extent to which standard error bars overlap. Straight lines have been drawn between points for the reasons:

(a) that the analyses of covariance assumed a linear regression equation; and

(b) that statistical convention forbids other than a linear relationship when only two points have been plotted.

Extrapolations of the kind that might suggest other than linear functions are reserved for the discussion sections that follow each figure.

1. The Problem of Alpha vs. Beta

The selection of appropriate *alpha* and *beta* levels depends upon the relative risks involved in committing Type I and Type II errors. Or, as Winer expresses the problem, the "... decision rules depend in part upon what the (researcher) considers critical bounds on arriving at the wrong decision" (Winer, 1962:9). In the present study a Type I error amounts to rejecting a null hypothesis when that null hypothesis is in fact true (i.e., there was really no significant difference or change). On this basis a Type II error would be committed when a null hypothesis is not rejected but is in fact false. As Winer (1962:10) observes, the magnitude of a Type II error is partly dependent upon the level of significance and partly upon the truth of possible alternative hypotheses.

It has become conventional in most 'true experiments' for concentration to be given to setting alpha levels because a Type I error has been considered to harbor greater risks than a Type II error - not the least reason being that such experiments are, relatively speaking, easily replicable. In 'man on the hoof' or 'natural' research of an exploratory kind however, the researcher may be prepared to accept a slightly higher risk of erroneously declaring differences and changes on the grounds that part of the initial research rationale was to create pathways for more specific studies into probable areas of difference and change. This preparedness to concentrate in the present study as much on the setting of beta levels as on alpha levels can be warranted further by the context in which the research was done. Given the current state of development in Victoria of alternative environments to the Traditional school, the aims of generating further research and elaborating new and different perceptions on an educational problem appear to be at least as serious as the aim of declaring differences or changes with very low risk of error (see Appendix 1). As Winer points out:

> "The frequent use of the .05 and .01 levels of significance is a matter of convention having little scientific or logical basis. When the power of tests is likely to be low under these levels of significance and when type 1 and type 2 errors are of approximately equal importance, the .30 and .20 levels of significance may be more appropriate than the .05 and .01 levels." (Winer, 1962:13)

The foregoing discussion has focused on alpha and beta levels in terms of relative risk. There is a second consideration however that should also be taken into account. This concerns the adequacy of the measuring instruments on which the statistical tests are founded. While it is believed that all reasonable care has been taken in the development and use of the instruments and while, overall, these instruments may contribute to a reasonably accurate picture their precision as individual indexes of the concepts they purport to measure should not be over-rated. That is, the position should be avoided in which the Type I error of the statistical test is less than the error inherent in the measuring procedures, a position that would create a false impression of accuracy and precision.

On both grounds, relative risks of Type I and Type II errors and instrument limitations, the .10 level of significance is used in the decision rules in the present study. It should be remembered that each t-test is two-tailed test, so the percentile point in either direction is .05.

TABLE 8.1

OPEN GROUPS (INCLUDED)
MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT FIRST TESTING (N = 5)

Criterion	Mean	S.D.	S.E.
Student Attitudes	52.14	5.02	2.24
Creative Thinking	3.73	0.63	0.28
Collaborative Behavior	5.33	0.83	0.37
Preferred Activities			
A. Change-Sameness	27.60	2.31	1.03
B. Autonomy-Dependence	31.30	0.90	0.40
C. Intellectualised	29.16	1.31	0.59

TABLE 8.2

OPEN GROUPS (INCLUDED)
MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT SECOND TESTING (N = 5)

Criterion	Mean	S.D.	S.E.
Student Attitudes	53.01	5.94	2.66
Creative Thinking	4.05	1.14	0.51
Collaborative Behavior	6.15	0.80	0.36
Preferred Activities			
A. Change-Sameness	28.52	1.95	0.87
B. Autonomy-Dependence	31.84	1.39	0.62
C. Intellectualised	28.62	1.59	0.71

TABLE 8.3

TRADITIONAL GROUPS (INCLUDED)
MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT FIRST TESTING (N = 5)

Criterion	Mean	S.D.	S.E.
Student Attitudes	57.09	3.84	1.72
Creative Thinking	4.71	0.20	0.09
Collaborative Behavior	3.75	0.70	0.31
Preferred Activities			
A. Change-Sameness	28.56	0.93	0.42
B. Autonomy-Dependence	31.89	1.72	0.77
C. Intellectualised	28.56	1.07	0.48

TABLE 8.4

TRADITIONAL GROUPS (INCLUDED)
MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT SECOND TESTING (N = 5)

Criterion	Mean	S.D.	S.E.
Student Attitudes	60.41	1.98	0.89
Creative Thinking	4.53	0.33	0.15
Collaborative Behavior	4.00	0.88	0.39
Preferred Activities			
A. Change-Sameness	29.72	1.46	0.66
B. Autonomy-Dependence	31.73	1.51	0.68
C. Intellectualised	28.28	1.08	0.48

TABLE 8.5

METROPOLITAN GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS
ON CRITERION MEASURES AT FIRST TESTING (N = 10)

Criterion	Mean	S.D.	S.E.
Student Attitudes	51.43	4.32	1.37
Creative Thinking	4.06	0.67	0.21
Collaborative Behavior	4.63	1.20	0.38
Preferred Activities			
A. Change-Sameness	27.52	1.70	0.54
B. Autonomy-Dependence	31.62	1.27	0.40
C. Intellectualised	28.94	1.49	0.47

TABLE 8.6

METROPOLITAN GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS
ON CRITERION MEASURES AT SECOND TESTING (N = 10)

Criterion	Mean	S.D.	S.E.
Student Attitudes	51.22	6.22	1.97
Creative Thinking	4.12	0.91	0.29
Collaborative Behavior	5.00	1.48	0.47
Preferred Activities			
A. Change-Sameness	28.26	2.10	0.66
B. Autonomy-Dependence	31.76	1.32	0.42
C. Intellectualised	28.50	1.17	0.37

TABLE 8.7

RURAL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT FIRST TESTING (N = 10)

Criterion	Mean	S.D.	S.E.
Student Attitudes	58.77	3.05	0.96
Creative Thinking	4.50	0.73	0.23
Collaborative Behavior	4.32	0.73	0.23
Preferred Activities			
A. Change-Sameness	29.05	0.86	0.27
B. Autonomy-Dependence	31.94	1.52	0.48
C. Intellectualised	28.95	1.53	0.48

TABLE 8.8

RURAL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT SECOND TESTING (N = 10)

Criterion	Mean	S.D.	S.E.
Student Attitudes	54.73	2.80	0.91
Creative Thinking	4.30	0.53	0.17
Collaborative Behavior	4.78	0.83	0.26
Preferred Activities			
A. Change-Sameness	29.85	1.14	0.36
B. Autonomy-Dependence	31.83	1.25	0.40
C. Intellectualised	27.84	0.95	0.30

TABLE 8.9

LARGE-SCHOOL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT FIRST TESTING (N = 12)

Criterion	Mean	S.D.	S.E.
Student Attitudes	56.32	4.60	1.33
Creative Thinking	4.09	0.66	0.19
Collaborative Behavior	4.23	0.99	0.29
Preferred Activities			
A. Change-Sameness	27.83	1.62	0.47
B. Autonomy-Dependence	31.36	1.31	0.38
C. Intellectualised	28.77	1.58	0.46

TABLE 8.10

LARGE-SCHOOL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT SECOND TESTING (N = 12)

Criterion	Mean	S.D.	S.E.
Student Attitudes	57.81	5.02	1.45
Creative Thinking	4.06	0.69	0.20
Collaborative Behavior	4.67	1.27	0.37
Preferred Activities			
A. Change-Sameness	29.22	1.99	0.57
B. Autonomy-Dependence	31.55	1.42	0.41
C. Intellectualised	28.13	0.96	0.28

TABLE 8.11

SMALL-SCHOOL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT FIRST TESTING (N = 8)

Criterion	Mean	S.D.	S.E.
Student Attitudes	53.27	5.59	1.98
Creative Thinking	4.57	0.75	0.27
Collaborative Behavior	4.84	0.92	0.32
Preferred Activities			
A. Change-Sameness	28.97	1.14	0.40
B. Autonomy-Dependence	32.01	1.52	0.54
C. Intellectualised	29.21	1.36	0.48

TABLE 8.12

SMALL-SCHOOL GROUPS

MEANS, STANDARD DEVIATIONS AND STANDARD ERRORS ON CRITERION MEASURES AT SECOND TESTING (N = 8)

Criterion	Mean	S.D.	S.E.
Student Attitudes	55.89	5.86	2.07
Creative Thinking	4.44	0.79	0.28
Collaborative Behavior	5.23	1.01	0.36
Preferred Activities			
A. Change-Sameness	28.82	1.64	0.58
B. Autonomy-Dependence	32.16	0.95	0.34
C. Intellectualised	28.22	1.32	0.47

TABLE 8.13

ANALYSIS OF COVARIANCE
FOR OPEN AND TRADITIONAL GROUPS MEASURED ON
ATTITUDES TO HIGH SCHOOL

Correlation (Total)	0.83	
Unadjusted Y Means	53.01(O)	60.41(T)
Adjusted Y Means	54.91(O)	58.52(T)
df for Adjusted Means	1 and 7	
F-value	2.21	

TABLE 8.14

ANALYSIS OF COVARIANCE
FOR OPEN AND TRADITIONAL GROUPS MEASURED ON
CREATIVE THINKING

Correlation (Total)	0.80	
Unadjusted Y Means	4.05(O)	4.53(T)
Adjusted Y Means	4.85(O)	3.73(T)
df for Adjusted Means	1 and 7	
F-value	8.26	

TABLE 8.15

ANALYSIS OF COVARIANCE FOR OPEN AND TRADITIONAL GROUPS MEASURED ON COLLABORATIVE BEHAVIOR

Correlation (Total)	0.97	
Unadjusted Y Means	6.15(0)	4.00(T)
Adjusted Y Means	5.32(0)	4.83(T)
df for Adjusted Means	1 and 7	
F-value	1.89	

TABLE 8.16

ANALYSIS OF COVARIANCE FOR OPEN AND TRADITIONAL GROUPS MEASURED ON PREFERRED ACTIVITIES (CHANGE-SAMENESS)

Correlation (Total)	0.75	
Unadjusted Y Means	28.52(0)	29.72(T)
Adjusted Y Means	28.87(0)	29.38(T)
df for Adjusted Means	1 and 7	
F-value	0.31	

TABLE 8.17

ANALYSIS OF COVARIANCE
FOR OPEN AND TRADITIONAL GROUPS MEASURED ON
PREFERRED ACTIVITIES (AUTONOMY-DEPENDENCE)

Correlation (Total)	0.88	
Unadjusted Y Means	31.84(0)	31.73(T)
Adjusted Y Means	32.13(0)	31.45(T)
df for Adjusted Means	1 and 7	
F-value	2.06	

TABLE 8.18

ANALYSIS OF COVARIANCE
FOR OPEN AND TRADITIONAL GROUPS MEASURED ON
PREFERRED ACTIVITIES (INTELLECTUALISED)

Correlation (Total)	0.28	
Unadjusted Y Means	28.62(0)	28.28(T)
Adjusted Y Means	28.53(0)	28.37(T)
df for Adjusted Means	1 and 7	
F-value	0.03	

TABLE 8.19

ANALYSIS OF COVARIANCE FOR METROPOLITAN AND RURAL GROUPS MEASURED ON ATTITUDES TO HIGH SCHOOL

Correlation (Total)	0.84	
Unadjusted Y Means	53.20(M)	60.88(R)
Adjusted Y Means	55.84(M)	58.25(R)
df for Adjusted Means	1 and 17	
F-value	1.60	

TABLE 8.20

ANALYSIS OF COVARIANCE FOR METROPOLITAN AND RURAL GROUPS MEASURED ON CREATIVE THINKING

Correlation (Total)	0.65	
Unadjusted Y Means	4.12(M)	4.30(R)
Adjusted Y Means	4.27(M)	4.15(R)
df for Adjusted Means	1 and 17	
F-value	0.16	

TABLE 8.21

ANALYSIS OF COVARIANCE FOR METROPOLITAN AND RURAL GROUPS MEASURED ON COLLABORATIVE BEHAVIOR

Correlation (Total)	0.96	
Unadjusted Y Means	5.00(M)	4.79(R)
Adjusted Y Means	4.82(M)	4.79(R)
df for Adjusted Means	1 and 17	
F-value	0.45	

TABLE 8.22

ANALYSIS OF COVARIANCE FOR METROPOLITAN AND RURAL GROUPS MEASURED ON PREFERRED ACTIVITIES (CHANGE-SAMENESS)

Correlation (Total)	0.59	
Unadjusted Y Means	28.26(M)	29.85(R)
Adjusted Y Means	28.72(M)	29.39(R)
df for Adjusted Means	1 and 17	
F-value	0.67	

TABLE 8.23

ANALYSIS OF COVARIANCE
FOR METROPOLITAN AND RURAL GROUPS MEASURED ON PREFERRED ACTIVITIES (AUTONOMY-DEPENDENCE)

Correlation (Total)	0.83	
Unadjusted Y Means	31.76(M)	31.83(R)
Adjusted Y Means	31.89(M)	31.70(R)
df for Adjusted Means	1 and 17	
F-value	0.28	

TABLE 8.24

ANALYSIS OF COVARIANCE
FOR METROPOLITAN AND RURAL GROUPS MEASURED ON PREFERRED ACTIVITIES (INTELLECTUALISED)

Correlation (Total)	0.83	
Unadjusted Y Means	28.50(M)	27.84(R)
Adjusted Y Means	31.89(M)	27.84(R)
df for Adjusted Means	1 and 17	
F-value	1.71	

TABLE 8.25

ANALYSIS OF COVARIANCE FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON ATTITUDES TO HIGH SCHOOL

Correlation (Total)	0.84	
Unadjusted Y Means	57.81(L)	55.89(S)
Adjusted Y Means	56.57(L)	57.74(S)
df for Adjusted Means	1 and 17	
F-value	0.31	

TABLE 8.26

ANALYSIS OF COVARIANCE FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON CREATIVE THINKING

Correlation (Total)	0.65	
Unadjusted Y Means	4.06(L)	4.44(S)
Adjusted Y Means	4.13(L)	4.32(S)
df for Adjusted Means	1 and 17	
F-value	0.06	

TABLE 8.27

ANALYSIS OF COVARIANCE
FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON COLLABORATIVE BEHAVIOR

Correlation (Total)	0.18	
Unadjusted Y Means	4.67(L)	5.23(S)
Adjusted Y Means	4.68(L)	5.22(S)
df for Adjusted Means	1 and 17	
F-value	0.67	

TABLE 8.28

ANALYSIS OF COVARIANCE
FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON PREFERRED ACTIVITIES (CHANGE-SAMENESS)

Correlation (Total)	0.58	
Unadjusted Y Means	29.22(L)	28.82(S)
Adjusted Y Means	29.68(L)	28.13(S)
df for Adjusted Means	1 and 17	
F-value	3.59	

TABLE 8.29

ANALYSIS OF COVARIANCE
FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON PREFERRED ACTIVITIES (AUTONOMY-DEPENDENCE)

Correlation (Total)	0.83	
Unadjusted Y Means	31.55(L)	32.16(S)
Adjusted Y Means	31.62(L)	32.06(S)
df for Adjusted Means	1 and 17	
F-value	0.91	

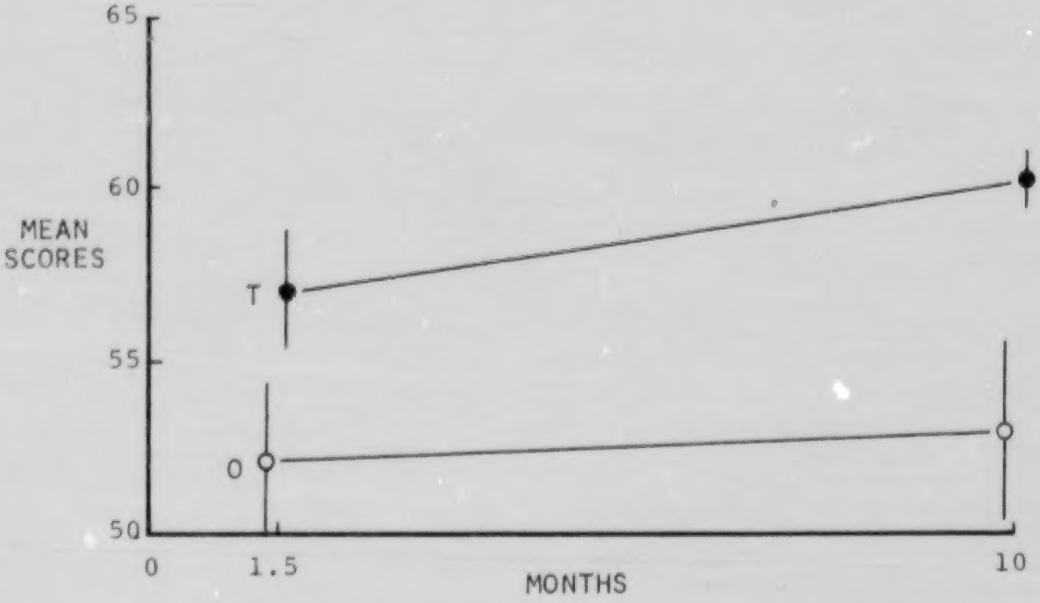
TABLE 8.30

ANALYSIS OF COVARIANCE
FOR LARGE AND SMALL SCHOOL GROUPS MEASURED ON PREFERRED ACTIVITIES (INTELLECTUALISED)

Correlation (Total)	0.13	
Unadjusted Y Means	28.13(L)	28.22(S)
Adjusted Y Means	28.17(L)	28.17(S)
df for Adjusted Means	1 and 17	
F-value	0.01	

FIGURE 8.1

SUMMARY OF RESULTS FOR OPEN AND TRADITIONAL GROUPS
ON CRITERION MEASURE: ATTITUDES TO HIGH SCHOOL



Comparison after six weeks

t-value = 1.75; P > .10; df = 8

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 2.64; P < .10; df = 8

Decision: Reject null hypothesis
Difference after ten months is significant

Change from six weeks to ten months

ANCOVA F - value = 2.21; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

2. Discussion of Hypotheses 1.1, 4.1 and 7.1

Figure 8.1 summarises the results obtained from testing Hypotheses 1.1, 4.1 and 7.1, concerning the differences between, and relative changes over time in Open and Traditional groups measured on attitudes to high school.

It will be remembered that in the test, Student Attitudes to High School, lower scores represent more positive attitudes and higher scores represent more negative attitudes. When the actual mean scores (from Tables 8.1, 8.2, 8.3 and 8.4) of the Open and Traditional groups were inspected the Open groups (already more positive than the Traditional groups) are seen to have moved slightly in the negative direction between the first and second testings. The Traditional groups had become increasingly negative by the time of second testing.

When compared six weeks after commencement of the school year the groups were not significantly different from each other although, comparatively, students from the Open groups tended to hold somewhat more positive attitudes. Of course, this interpretation can only be based on extrapolation to the longer term picture because, technically, the literal interpretation of the relevant t-value is not a tendency but rather a chance difference.

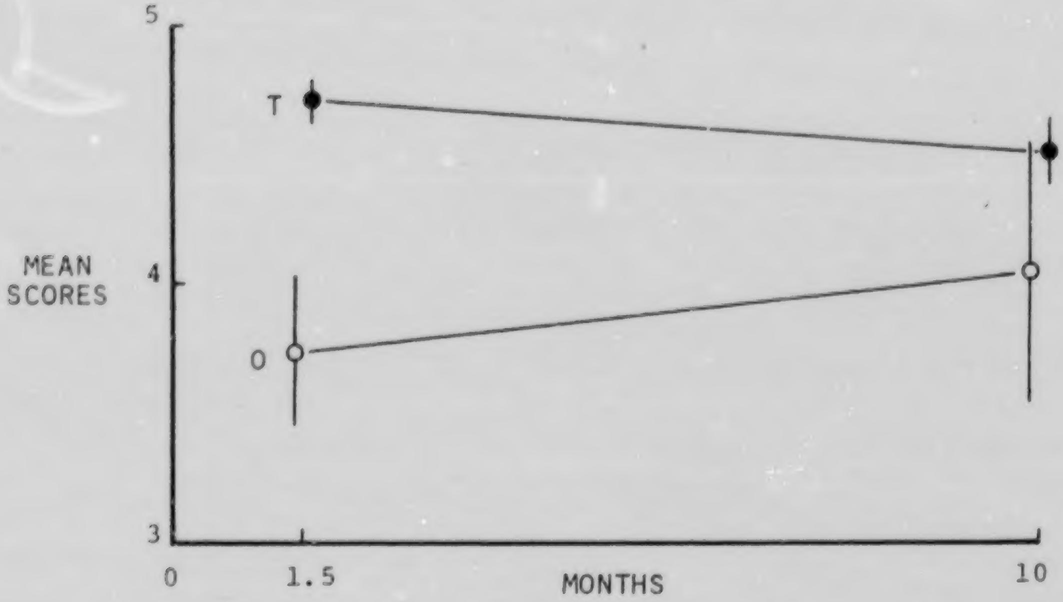
After ten months the difference was significant, students from the Open groups being less negative in attitude than their Traditional counterparts. However, when the change from six weeks to ten months is analysed it is found not to have been a significant change relative to the state of affairs that already existed when the first testing program took place.

While not conclusive, this result suggests that relative differences in attitude to school between the Open and Traditional groups had developed steadily from the commencement of the school year at which time, it is assumed, their attitudes to school were roughly the same, any differences then being due to chance factors. Hence the non-significant t-value can be placed in the context of the non-significant ANCOVA F-value, suggesting that the rate of deterioration in attitude among the Traditional groups, while not significant in itself eventually led to a difference from Open groups that was significant.

In short, the attitudes to high school of students in Open groups remain relatively stable during first year while the attitudes of students in Traditional groups deteriorate to the point of being significantly different, but at a rate which is not significant.

FIGURE 8.2

SUMMARY OF RESULTS FOR OPEN AND TRADITIONAL GROUPS ON CRITERION MEASURE: CREATIVE THINKING



Comparison after six weeks

t-value = 3.34; P < .10; df = 8

Decision: Reject null hypothesis
Difference after six weeks is significant

Comparison after ten months

t-value = 0.90; P > .10; df = 8

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 8.25; P < .10; df = 1 and 7

Decision: Reject null hypothesis
Relative change is significant

3. Discussion of Hypotheses 1.2, 4.2 and 7.2

Figure 8.2 summarises the results obtained from testing Hypotheses 1.2, 4.2 and 7.2, concerning the differences between, and relative changes over time in Open and Traditional groups measured on creative thinking.

Higher scores on the creativity measure indicate what supporters of Open Education would consider to be better performance; hence, inspection of the respective mean scores (from Tables 8.1, 8.2, 8.3 and 8.4) obtained by Open and Traditional groups indicates that the Traditional groups performed better in both testing sessions. On the surface, this finding might appear to settle a dispute between teachers in Open and Traditional environments, although in a direction that might even surprise many teachers who support Traditional Education - the former group of teachers asserting that Open Education environments were more conducive of student creativity, the latter doubting that any difference should be anticipated.

An examination of Figure 8.2 however, suggests the operation of a somewhat more complex process than is apparent at the outset. Six weeks after the commencement of the school year there was already a significant difference in level of creativity between the Open and Traditional groups, a difference residing in favour of the Traditional groups. After ten months the difference is only a chance difference, the Open groups having improved somewhat and the Traditional groups having deteriorated slightly. When the ANCOVA F-value was accounted for, the relative change between Open and Traditional groups was significant; but this change was in the direction of less rather than greater difference.

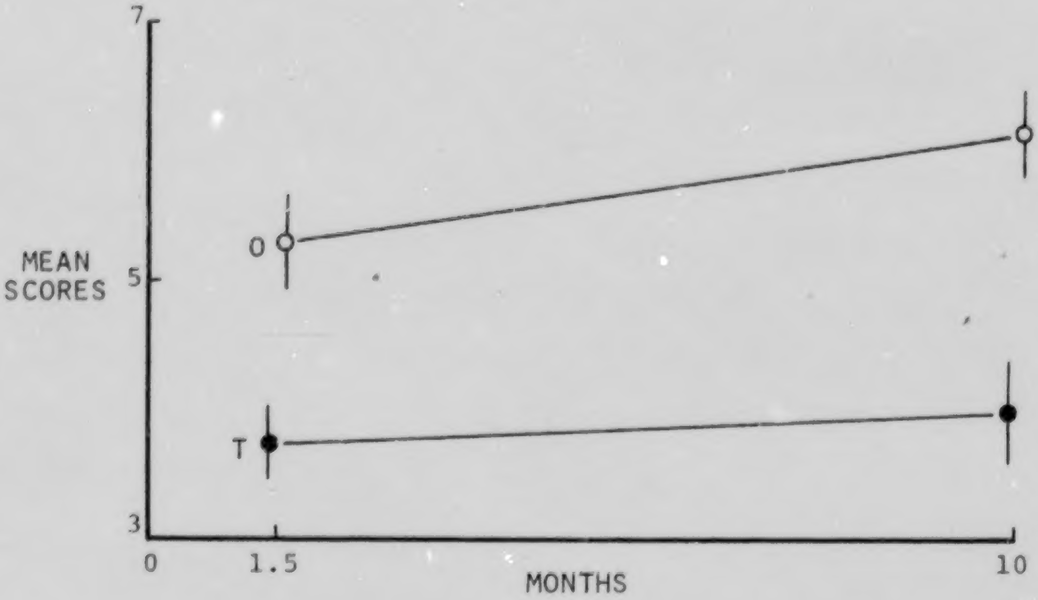
Assuming again that the only differences which might have existed at the start of the school year were attributable to chance, the Open groups underwent rapid deterioration in their performance of a creativity task such that by the time six weeks had elapsed they were significantly worse than their Traditional counterparts.

Yet, by the time ten months had elapsed they had undergone a significant rate of improvement relative to the Traditional groups, sufficient to reduce any difference between the groups to a chance difference.

Now, although the analysis of covariance strategy used in the present study was based on a linear regression equation, and any conclusive interpretation should be restricted by an assumption of linearity of regression between X(first testing) and Y(second testing), it is tempting to postulate a curvilinear arrangement. The basis of a curvilinear arrangement becomes clearer when the case study data in Chapters 9 and 10 are taken into account, suggestive of the following: In the process of learning about, adjusting to and performing in Open Education environments, many students experience considerable social and psychological disorganisation or disorientation which may require as much as a year or more to overcome. This disorganisation occurs regardless of school location and regardless of the fact that those same students may display significantly more positive attitudes to school than students in Traditional groups (see Discussion of Hypotheses 1.1, 4.1 and 7.1). The resulting 'performance path' appears to trace a U-shaped curve. This matter is considered further in Chapter 11.

FIGURE 8.3

SUMMARY OF RESULTS FOR OPEN AND TRADITIONAL GROUPS ON CRITERION MEASURE: COLLABORATIVE BEHAVIOR



Comparison after six weeks

t-value = 4.63; P < .10; df = 8

Decision: Reject null hypothesis
Difference after six weeks is significant

Comparison after ten months

t-value = 5.70; P < .10; df = 8

Decision: Reject null hypothesis
Difference after ten months is significant

Change from six weeks to ten months

ANCOVA F - value = 1.89; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

4. Discussion of Hypotheses 1.3, 4.3 and 7.3

Figure 8.3 summarises the results obtained from testing Hypotheses 1.3, 4.3 and 7.3, concerning the differences between, and relative changes in Open and Traditional groups measured on collaborative behavior.

Higher scores on the collaborative behavior measure indicate a greater frequency, variety and quality of interactions relevant to work-associated tasks. Inspection of the mean scores (from Tables 8.1, 8.2, 8.3 and 8.4) obtained by Open and Traditional groups reveals that the Open groups utilised greater frequency, variety and quality of collaborative behavior on both occasions when tested. As the differences in favor of Open groups were significant each time, it appears that the organisers of these groups had been relatively successful in developing work environments in which collaboration between students was a reality. By implication, less actual classroom teaching of an expository kind must have occurred, although precise findings on this matter were not sought.

Of course, the methodology used in the present study does not lend itself to any separate analysis of the relationship between high and low levels of collaboration and high and low levels of intellectual output or quantity of work. For, while this issue is clearly worthy of further research, the present study has simply tried to establish the veracity or otherwise of Open educators' claims that collaborative work environments had been created.[1] Subsequent research might well be addressed to the problem of utilising level of social interaction as an independent variable in a regression analysis of anticipated consequences.

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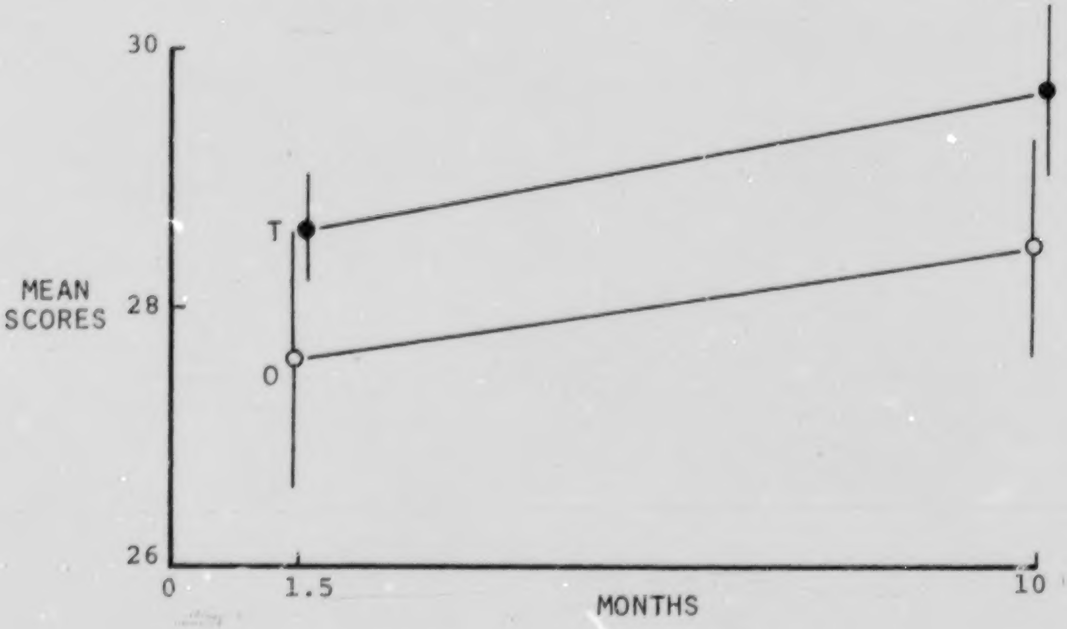
[1] That such environments were a 'good' thing was assumed a priori by these individuals.

With regard to relative change over time no significant change between six weeks and ten months arose, suggesting that the essential features of collaborative work environments had been established in the first six weeks of operation. In view of the previous comment, this assertion must not be interpreted to mean that any optimal level of educational advantage was also reached within those six weeks; indeed it may be that the anticipated consequences would develop gradually over a long period even though the basic environment had been established quite readily.

Of incidental note is that when the means obtained by Open and Traditional groups are adjusted for the results of the first testing program, the Traditional groups are seen to have gained relatively more than the Open groups with regard to level of collaborative behavior (see Table 8.15).

FIGURE 8.4

SUMMARY OF RESULTS FOR OPEN AND TRADITIONAL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (CHANGE - SAMENESS)



Comparison after six weeks

t-value = 0.86; P > .10; df = 8

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 1.10; P > .10; df = 8

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.31; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

5. Discussion of Hypotheses 1.4, 4.4 and 7.4

Figure 8.4 summarises the results obtained from testing Hypotheses 1.4, 4.4 and 7.4 concerning the differences between, and relative changes over time in Open and Traditional groups measured on preferred activities involving change or sameness.

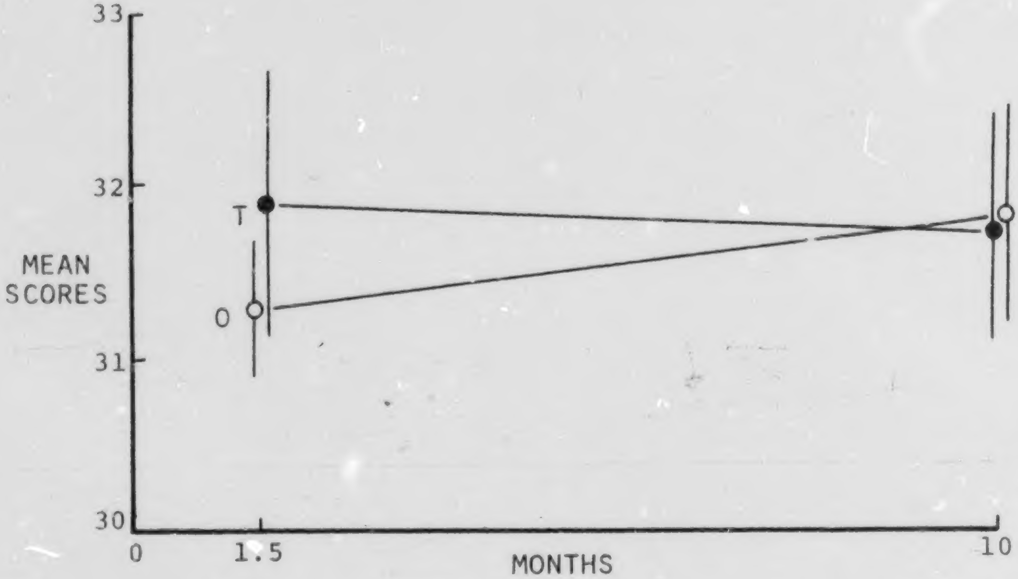
Lower scores on this measure indicate greater preference for activities involving change. From the results presented in Tables 8.1, 8.2, 8.3 and 8.4 it is evident that only superficial differences existed between Open and Traditional groups, the former showing a slightly greater preference for activities involving change. When compared after six weeks of operation no significant difference existed between the two groups. Similarly, after ten months the only differences that could be observed were attributable to chance (Figure 8.4).

When the change from six weeks to ten months is examined the relative change is not significant at all. Comparison of the unadjusted means at second testing and those same means adjusted for the results of the first testing indicates slightly greater movement towards preference for change on the part of the Open groups (Table 8.16). The ANCOVA F-value (Figure 8.4), however, is also not significant, any relative change being attributable only to chance.

In short, if there is any likelihood of difference between the Open and Traditional groups at a particular time, or any relatively different rate of change over time it is clearly a much longer-term phenomenon than can be observed in the first year of secondary schooling.

FIGURE 8.5

SUMMARY OF RESULTS FOR OPEN AND TRADITIONAL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (AUTONOMY - DEPENDENCE)



Comparison after six weeks

t-value = 0.69; P > .10; df = 8

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.12; P > .10; df = 8

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 2.06; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

6. Discussion of Hypotheses 1.5, 4.5 and 7.5

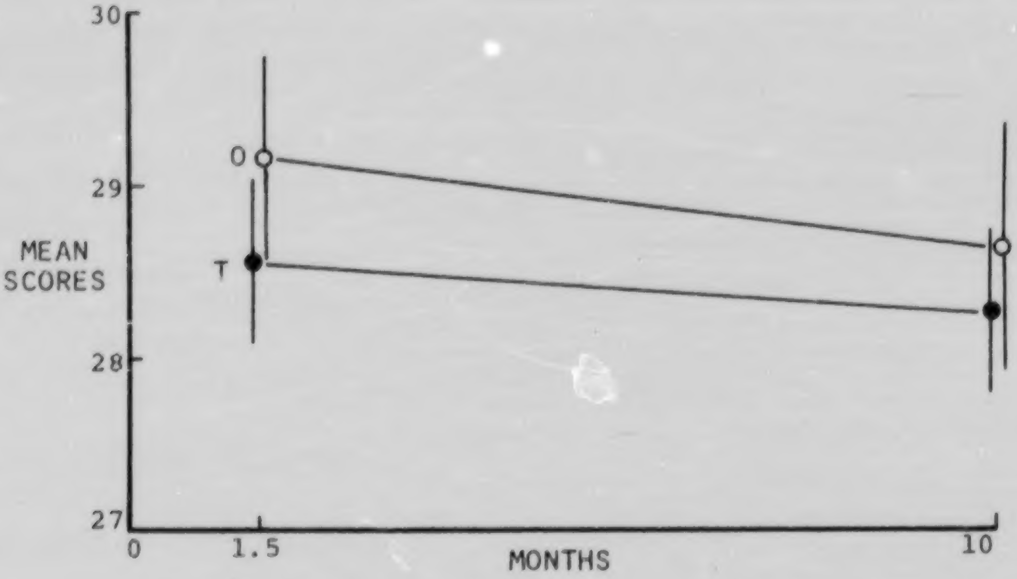
Figure 8.5 summarises the results obtained from testing Hypotheses 1.5, 4.5 and 7.5 concerning the differences between, and relative changes over time in Open and Traditional groups measured on preferred activities involving change or sameness.

Lower scores on this measure indicate greater preference for activities involving autonomy. The results presented in Tables 8.1, 8.2, 8.3 and 8.4 reveal only marginal differences between the Open and Traditional groups in preference for activities involving change. No significant difference existed between the groups either six weeks or ten months after commencement of the school year (Figure 8.5).

Similarly, the relative change over time between six weeks and ten months is not significant, the very slight change being attributable only to chance. Again, if there is any likelihood of differences between groups or differential rates of development in preference for activities involving autonomy or dependence, it does not become evident within the first year of secondary schooling.

FIGURE 8.6

SUMMARY OF RESULTS OF OPEN AND TRADITIONAL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (INTELLECTUALISED)



Comparison after six weeks

t-value = 0.79; P > .10; df = 8

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.39; P > .10; df = 8

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.03; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

7. Discussion of Hypotheses 1.6, 4.6 and 7.6

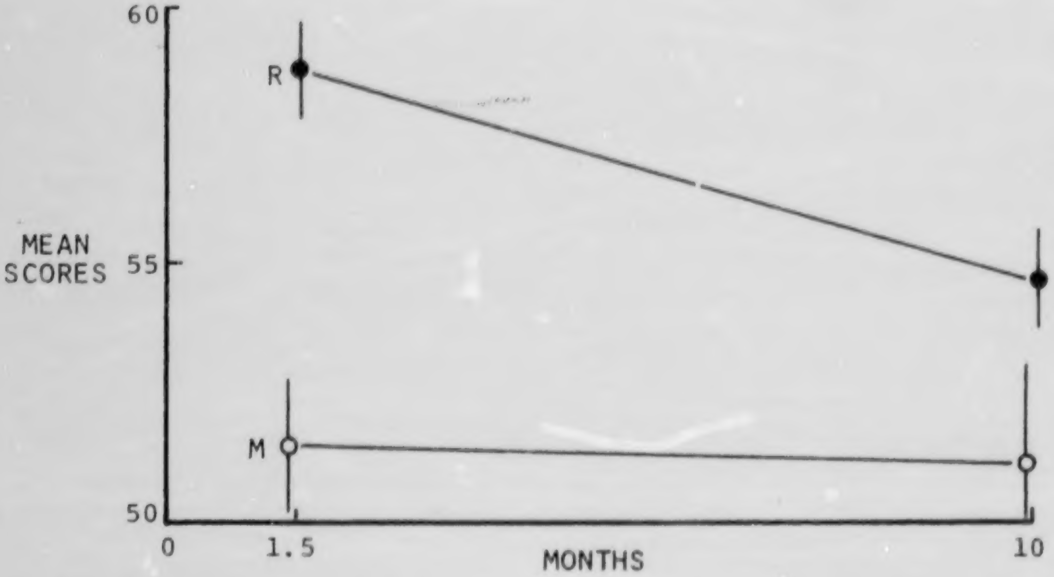
The results obtained from testing Hypotheses 1.6, 4.6 and 7.6 concerning the differences between, and relative changes over time in Open and Traditional groups measured on preference for intellectualised activities, are summarised in Figure 8.6.

Lower scores on this measure indicate greater preference for intellectualised activities. As with preferred activities involving change or sameness and autonomy or dependence, only the most superficial differences existed between Open and Traditional groups with respect to preference for intellectualised activities. No significant difference between the groups was evident after six weeks of operation nor after ten months had elapsed.

The low ANCOVA F-value (Table 8.18) indicates that the relative change between six weeks and ten months was also not significant. Comparison of the means at second testing, when adjusted for the results of the first testing, shows that virtually no difference between Open and Traditional groups can be discerned.

FIGURE 8.7

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS
ON CRITERION MEASURE: ATTITUDES TO HIGH SCHOOL



Comparison after six weeks

t-value = 4.40; P < .10; df = 18

Decision:	Reject null hypothesis Difference after six weeks is significant

Comparison after ten months

t-value = 1.62; P > .10; df = 18

Decision:	Accept null hypothesis Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 1.60; P > .10; df = 1 and 17

Decision:	Accept null hypothesis Relative change is not significant

8. Discussion of Hypotheses 2.1, 5.1 and 8.1

Figure 8.7 summarises the results obtained from testing Hypotheses 2.1, 5.1 and 8.1 concerning the differences between, and relative changes over time in Metropolitan and Rural groups measured on attitudes to high schools.

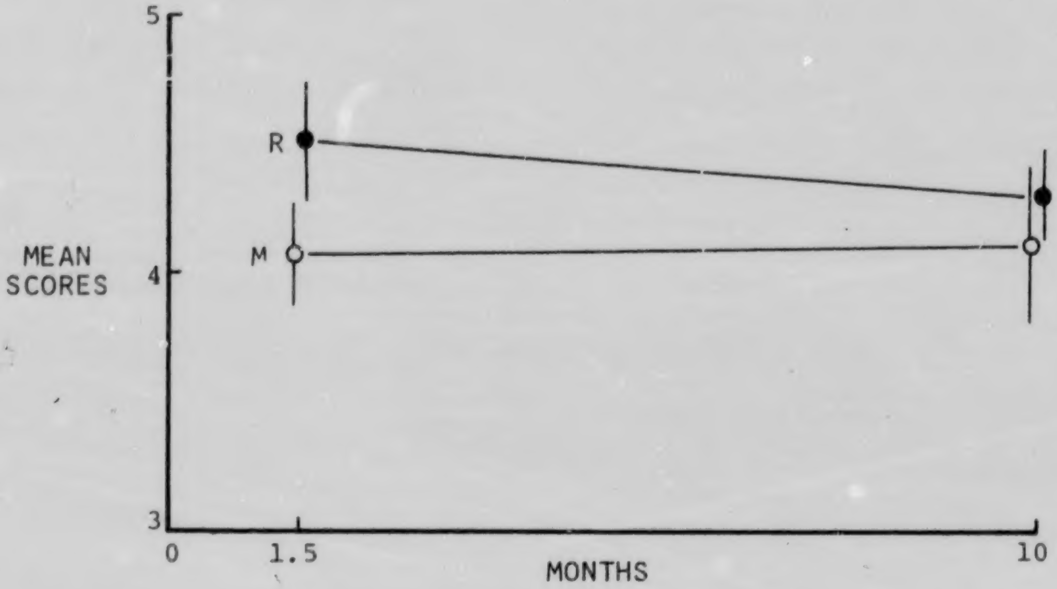
Six weeks after commencement of the school year a significant difference was observed between the attitudes of the Metropolitan and Rural groups, the former displaying more positive attitudes (see Tables 8.5, 8.6, 8.7 and 8.8). When the actual means obtained after ten months are inspected the Metropolitan groups are still seen to display more positive attitudes although as Figure 8.7 shows, the difference at that stage was not significant and must be attributed to chance in the final analysis.

The relative change over time between six weeks and ten months was not significant even though an inspection of the actual means suggests that while the attitudes of Metropolitan groups remained stable, those of the Rural groups improved somewhat.

Hence, although the significant difference between the groups had disappeared by second testing, the relative change over time which resulted in that disappearance was not significant. When these two elements are placed together, a cautious extrapolation can be made; namely, that some groups of students in country areas at the start of their secondary schooling, manifest somewhat negative attitudes in students, that are overcome as the first year of secondary schooling progresses. Although the present study does not incorporate any detailed information, such factors as separation from a small, local primary school environment in order to travel (in some cases) quite long distances to a large secondary school environment may worry many students. A second matter referred to during the study, by one group of students related to a desire to "work on the farm" in preference to "being cooped up in a school".

FIGURE 8.8

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS ON CRITERION MEASURE: CREATIVE THINKING



Comparison after six weeks

t-value = 1.29; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.53; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.16; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

9. Discussion of Hypotheses 2.2, 5.2 and 8.2

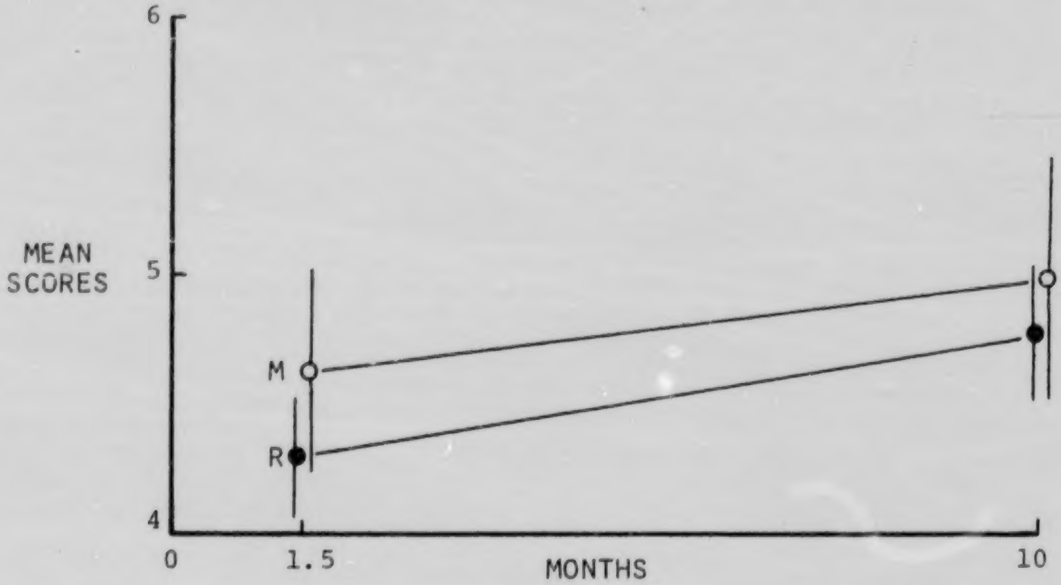
The results obtained from testing Hypotheses 2.2, 5.2 and 8.2 concerning the differences between, and relative changes over time in Metropolitan and Rural groups measured on creative thinking are summarised in Figure 8.8.

Although the actual means (Tables 8.5, 8.6, 8.7 and 8.8) show the Rural groups to have scored slightly higher than Metropolitan groups six weeks after commencement of the school year and again after ten months, both t-values in Figure 8.8 indicate that the differences were not significant on either occasion and could be attributed only to chance.

The relative change over time between six weeks and ten months was, as the ANCOVA F-value shows, also non-significant. Again, the marginal differences revealed by inspection of the means obtained at second testing, when adjusted for the results of the first testing (Table 8.20) were quite incidental.

FIGURE 8.9

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS ON CRITERION MEASURE: COLLABORATIVE BEHAVIOR



Comparison after six weeks

t-value = 0.71; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.41; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.45; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

10. Discussion of Hypotheses 2.3, 5.3 and 8.3

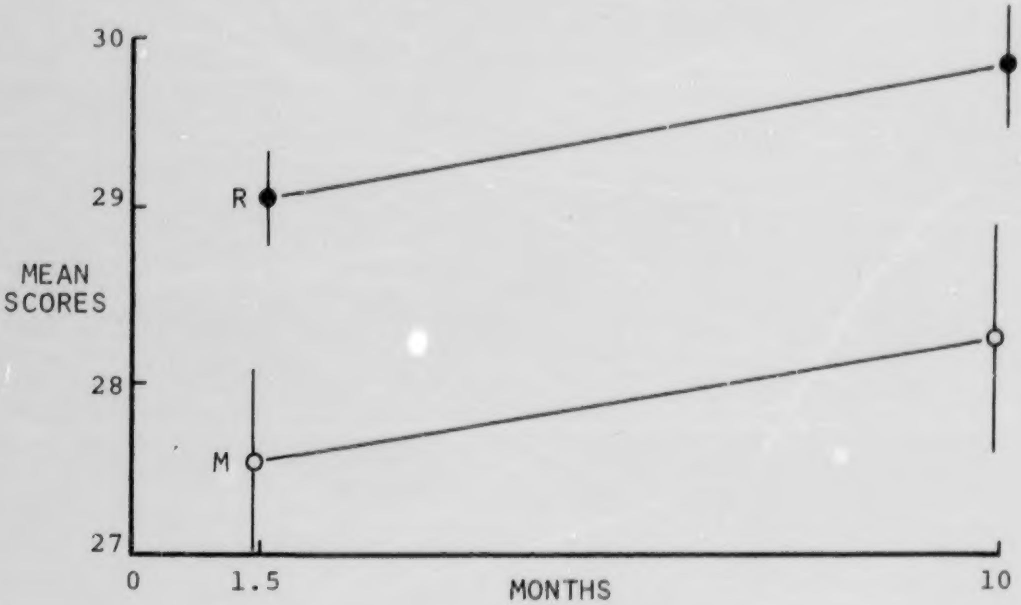
Figure 8.9 summarises the results obtained from testing Hypotheses 2.3, 5.3 and 8.3, concerning the differences between, and relative changes over time in Metropolitan and Rural groups measured on collaborative behavior.

Inspection of the actual means obtained indicates that only marginal differences existed between the Metropolitan and Rural groups on both testing occasions. As shown in Figure 8.9 these differences were not significant on either occasion. It is not surprising, therefore, to find that the relative change over time between the groups is also non-significant.

Frequency, variety and quality of social interaction did not vary according to the Metropolitan or Rural locations of the schools in which the various groups occurred.

FIGURE 8.10

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS ON CRITERION MEASURE: PREFERRED ACTIVITIES (CHANGE - SAMENESS)



Comparison after six weeks

t-value = 2.59; P < .10; df = 18

Decision: Reject null hypothesis
Difference after six weeks is significant

Comparison after ten months

t-value = 2.10; P < .10; df = 18

Decision: Reject null hypothesis
Difference after ten months is significant

Change from six weeks to ten months

ANCOVA F - value = 0.67; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

11. Discussion of Hypotheses 2.4, 5.4 and 8.4

Hypotheses 2.4, 5.4 and 8.4 were concerned with the differences between, and relative changes over time in Metropolitan and Rural groups measured on preferred activities involving change or sameness. Figure 8.10 summarises the results from testing these hypotheses.

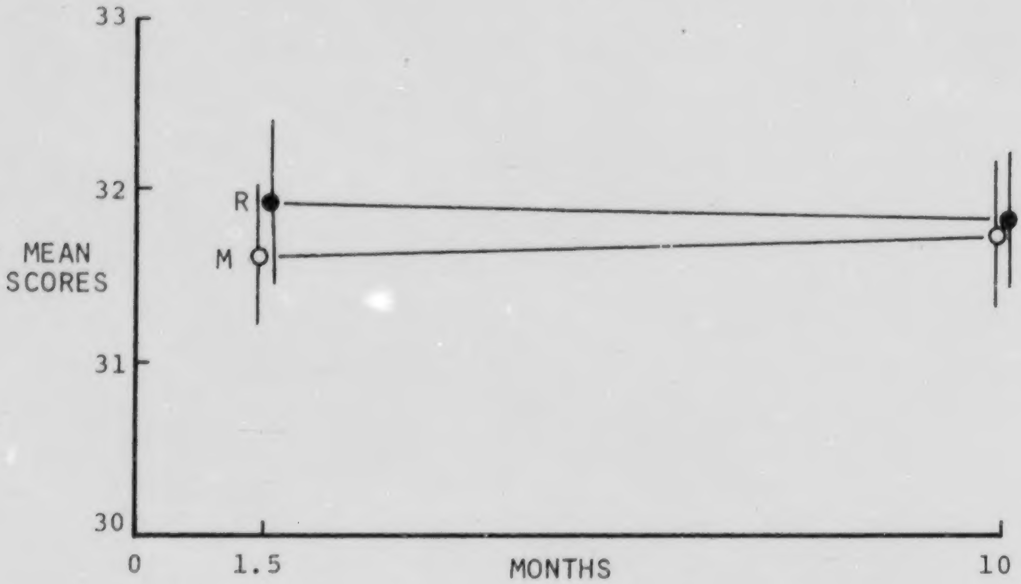
Six weeks after the commencement of the school year the respective groups were significantly different from each other in preference for activities involving change or sameness (Figure 8.10), and as indicated by inspection of the actual means in Tables 8.5 and 8.7, the greater preference for activities involving change occurred in the Metropolitan groups.

At the time of second testing, ten months after the school year commenced, a significant difference also existed, still in the same direction as before (Tables 8.6 and 8.8). However, the relative change over time between the groups was not significant from six weeks to ten months, the ANCOVA F-value indicating that such change as did occur was attributable to chance (Figure 8.10).

The relatively stable nature of the difference between the groups may be worthy of further investigation. No explanation can be attempted in the present context, but it should be noted that similar, although more significant trends emerged with regard to Metropolitan and Rural groups measured on attitudes to high school. Thus an association might be postulated between more positive attitudes to school and preference for activities involving change.

FIGURE 8.11

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (AUTONOMY - DEPENDENCE)



Comparison after six weeks

t-value = 0.52; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.11; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.28; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

12. Discussion of Hypotheses 2.5, 5.5 and 8.5

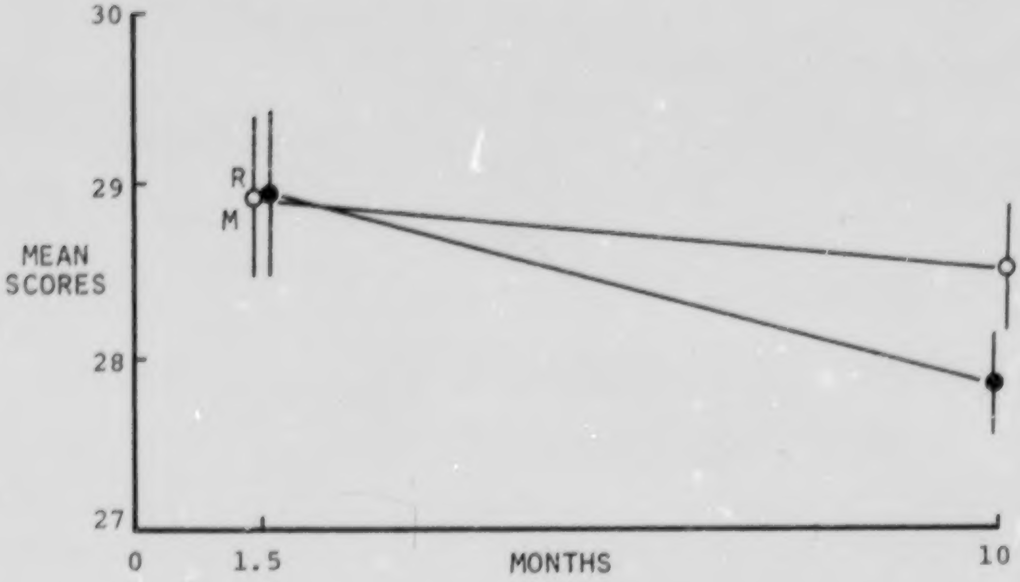
The results obtained from testing Hypotheses 2.5, 5.5 and 8.5 are summarised in Figure 8.11. These hypotheses concern the differences between, and relative changes over time in Metropolitan and Rural groups measured on preferred activities that involve autonomy or dependence.

From an inspection of the actual means (Tables 8.5, 8.6, 8.7 and 8.8) and from the respective t-values in Figure 8.11 it is clear that, effectively, there were no differences between Metropolitan and Rural groups either six weeks or ten months after the commencement of the school year.

In terms of relative change over time between six weeks and ten months no significant change occurred. Both the low ANCOVA F-value and the almost identical means at second testing, adjusted for the results of the first testing, lead to the conclusion that preference for activities involving autonomy or dependence did not vary according to the Metropolitan or Rural location of groups.

FIGURE 8.12

SUMMARY OF RESULTS FOR METROPOLITAN AND RURAL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (INTELLECTUALISED)



Comparison after six weeks

t-value = 0.01; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 1.40; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 1.71; P > .10; df = 1 and 7

Decision: Accept null hypothesis
Relative change is not significant

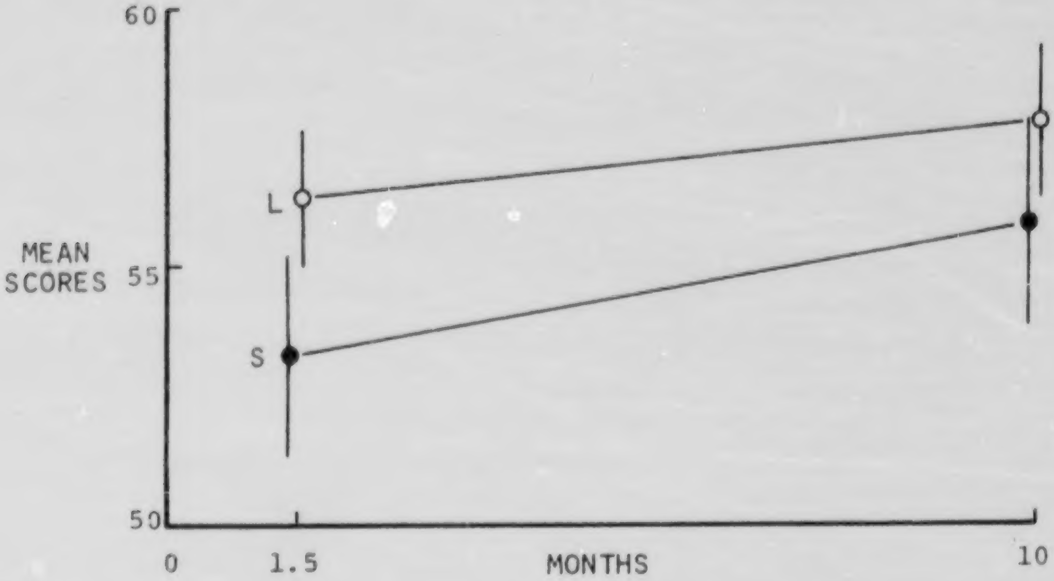
13. Discussion of Hypotheses 2.6, 5.6 and 8.6

Figure 8.12 summarises the results obtained from testing Hypotheses 2.6, 5.6 and 8.6 concerning the differences between, and relative changes over time in Metropolitan and Rural groups measured on preference for intellectualised activity.

On both testing occasions, six weeks and ten months after commencement of the school year, the Metropolitan and Rural groups were found to be not significantly different from each other. Nor were the relative changes over time between six weeks and ten months found to be significant. As with preference for activities involving personal autonomy or dependence, the fact of Metropolitan or Rural location of the various groups was of no consequence, at least during the first year of secondary schooling, in determining preference for intellectualised activities.

FIGURE 8.13

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS ON CRITERION MEASURE: ATTITUDES TO HIGH SCHOOL



Comparison after six weeks

t-value = 1.33; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.78; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.31; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

14. Discussion of Hypotheses 3.1, 6.1 and 9.1

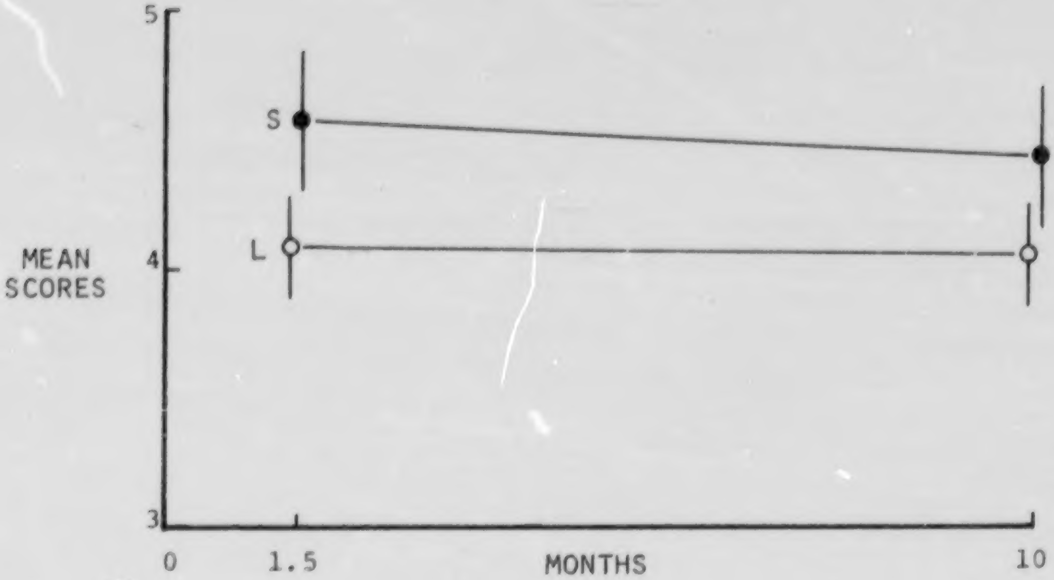
Hypotheses 3.1, 6.1 and 9.1 were concerned with the differences between, and relative changes over time in Large-school and Small-school groups measured in attitudes to high school. Figure 8.13 summarises the results from testing these hypotheses.

Six weeks from commencement of the school year the difference between the attitudes held by students from Large-school groups and those held by students from Small-school groups was not significant (Figure 8.13). The difference that did exist, while it must be attributed to chance, rested in favor of the students from Small-school groups manifesting the more positive attitudes (Tables 8.9 and 8.11).

By the time ten months had elapsed even less difference between the groups was observed. As could be expected on the basis of these results, the relative change over time from six weeks to ten months was also not significant.

FIGURE 8.14

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS ON CRITERION MEASURE: CREATIVE THINKING



Comparison after six weeks

t-value = 1.51; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 1.16; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.06; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

15. Discussion of Hypotheses 3.2, 6.2 and 9.2

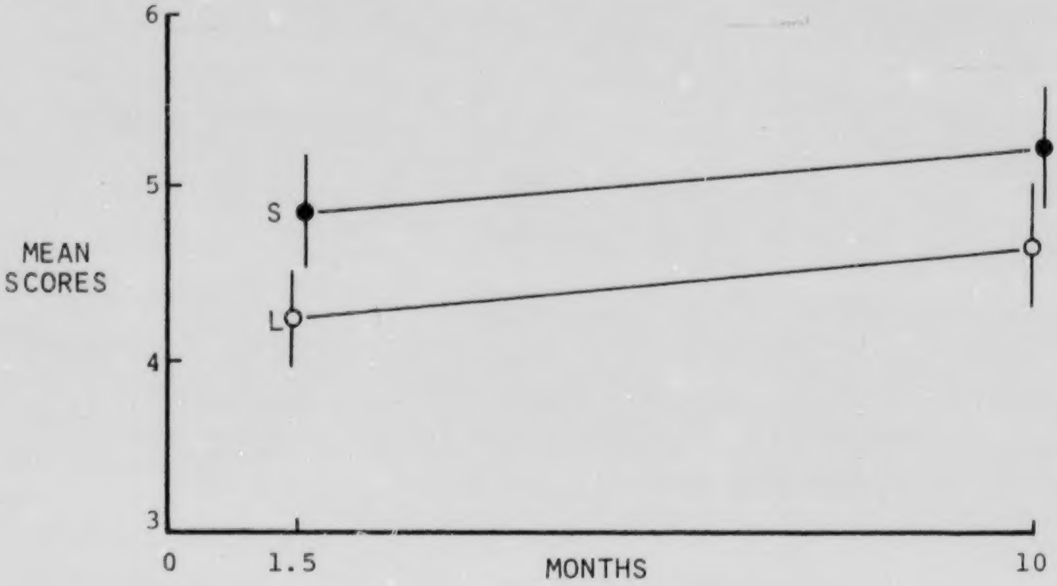
Figure 8.14 summarises the results obtained by testing Hypotheses 3.2, 6.2 and 9.2 concerning the differences between, and relative changes over time in Large-school and Small-school groups measured on creative thinking.

After six weeks of operation the Small-school groups were marginally but not significantly more successful on the creativity task (Tables 8.9 and 8.11). After ten months the same tendency was repeated but again the difference between the groups was not significant (Tables 8.10 and 8.12). Despite the lack of significant difference on either occasion however (resulting, technically, in acceptance of the null hypotheses), the quite negligible ANCOVA F-value which arose from testing the significance of relative change over time between the two groups, when taken into account as well, might suggest that a slight but stable difference really did exist in respect of creative thinking.

On these grounds, therefore, the null hypotheses expressing no difference between, and no relative change over time in the groups, while accepted statistically appear worthy of deferment for further investigation. However, it does not seem possible, on the data obtained in the present study, to elaborate alternative hypotheses as to the reasons for any slight, stable difference that such further investigation might locate.

FIGURE 8.15

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS
ON CRITERION MEASURE: COLLABORATIVE BEHAVIOR



Comparison after six weeks

t-value = 1.40; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 1.05; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.67; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

16. Discussion of Hypotheses 3.3, 6.3 and 9.3

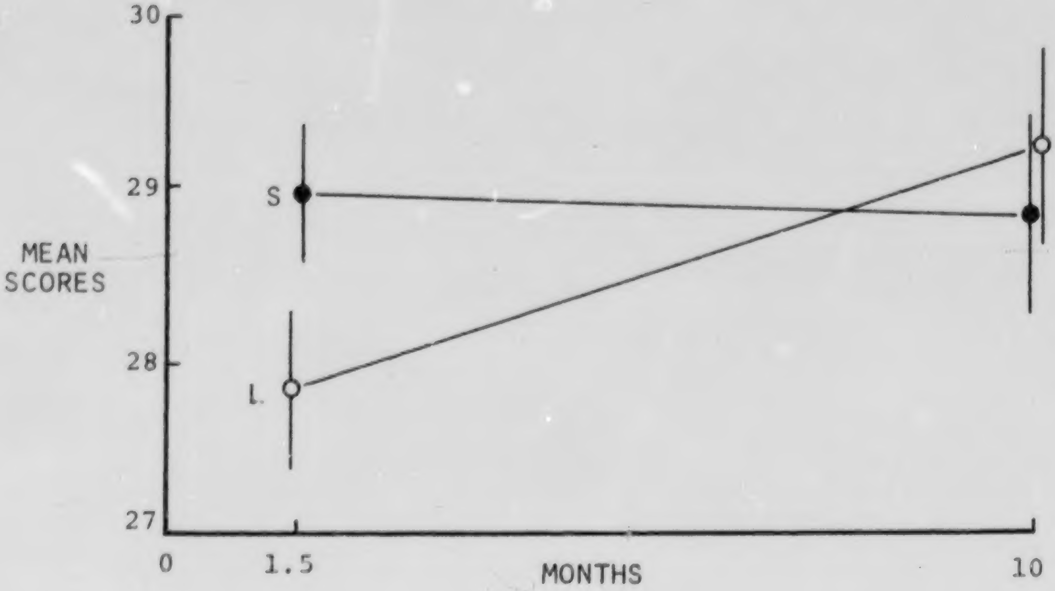
Figure 8.15 summarises the results from testing Hypotheses 3.3, 6.3 and 9.3 concerning differences between, and relative changes over time in Large-school and Small-school groups measured on collaborative behavior.

When assessed six weeks after commencement of the school year the groups were not significantly different from each other (Figure 8.15), such difference as did exist suggesting a marginally higher level of social interaction in respect of work tasks among the groups housed in Large schools (Tables 8.9 and 8.11). However, as was the case at the time of second testing, ten months into the school year, the marginal difference would seem to justify acceptance of the null hypothesis that no difference existed other than by chance.

When the relative change over time between six weeks and ten months was examined by correcting for the results of the first testing program it also was found to be not significant.

FIGURE 8.16

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS
ON CRITERION MEASURE: PREFERRED ACTIVITIES (CHANGE - SAMENESS)



Comparison after six weeks

t-value = 1.72; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.47; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 3.59; P < .10; df = 1 and 17

Decision: Reject null hypothesis
Relative change is significant

17. Discussion of Hypotheses 3.4, 6.4 and 9.4

The differences between, and relative changes over time in Large-school and Small-school groups measured on preferred activities involving change or sameness were examined through testing Hypotheses 3.4, 6.4 and 9.4. Figure 8.16 summarises these results.

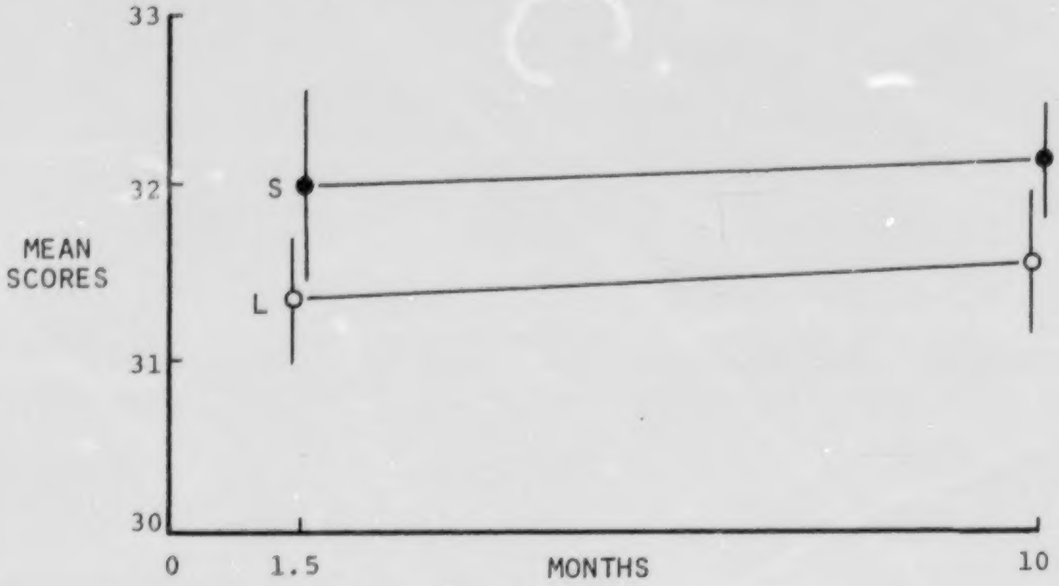
Six weeks after commencement of the school year no significant difference between the Large-school and Small-school groups was observed. However, it should be noted that this decision to accept the null hypothesis for technical statistical reasons is extremely marginal, the observed t-value being 1.72 and the t-value associated with a probability level of .10 with 18 degrees of freedom being 1.73.

For two reasons the final decision in this case will be a deferred decision. The first reason is that considerable emphasis has already been placed in this study on the setting of beta levels such that Type II errors could be avoided at least as effectively as could Type I errors. To declare a non-significant result on the basis of reference to the second decimal point of a t-value when the measuring instrument from which it derived was not so finely honed as to justify this level of discrimination seems a little foolish. The second reason relates to the other two analyses presented in Figure 8.16. For, while the difference between the two groups after ten months was significant, the relative change over time between six weeks and ten months was significant when the results of the second testing were adjusted for the results of the first testing (see Table 8.28).

From the actual means (Tables 8.9, 8.10, 8.11 and 8.12) and the adjusted means (Table 8.28) the picture that emerges is very difficult to interpret. Relatively speaking, if the linear model is assumed, the groups from Large schools appear to have moved in the direction of greater preference for activities involving change up to the time of the first testing program while the groups from Small schools appear to have moved in the direction of greater preference for activities involving sameness. Subsequently, the groups from Large schools have moved in the direction of greater preference for activities involving sameness while the groups from Small schools have remained fairly stable, shifting slightly in the direction of preference for activities involving change. Furthermore, their paths intersect, indicating that they have inverted or swapped positions relative to each other. Research subsequent to the present study is required to clarify these issues. Indeed, an *ex post facto* analysis of this data and a follow-up study might show relationships between such breakdowns as location and size of school.

FIGURE 8.17

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS ON CRITERION MEASURE: PREFERRED ACTIVITIES (AUTONOMY - DEPENDENCE)



Comparison after six weeks

t-value = 0.59; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 1.07; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.91; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

18. Discussion of Hypotheses 3.5, 6.5 and 9.5

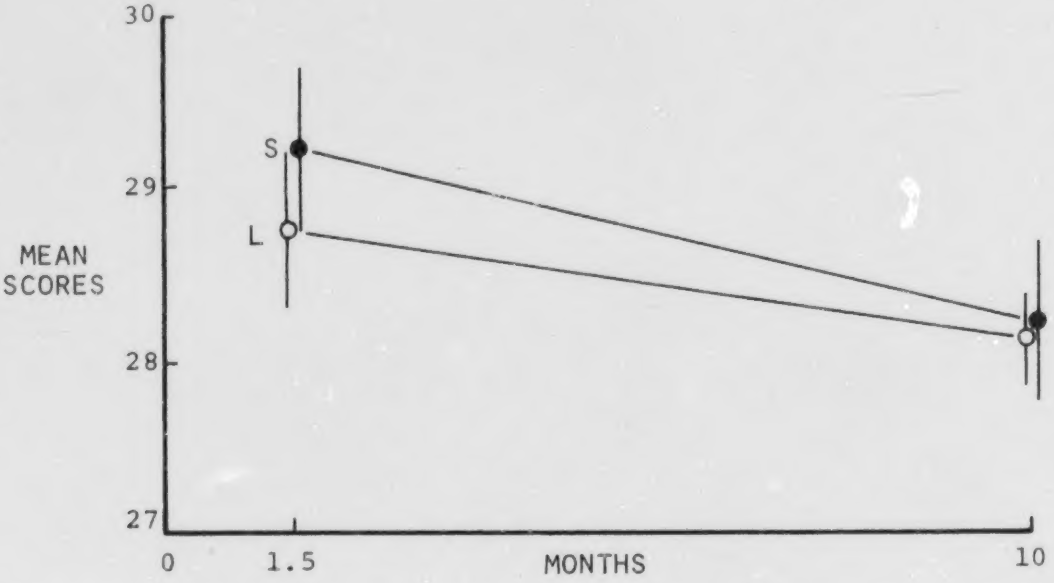
Hypotheses 3.5, 6.5 and 9.5 were concerned with the differences between, and relative changes over time in Large-school and Small-school groups measured on preference for activities involving autonomy or dependence. Figure 8.17 summarises the relevant results.

Neither at the testing after six weeks of operation nor at the testing after ten months of operation was a significant difference observed between the preferences for autonomous activities of groups from Large and Small schools. In each case the null hypothesis was accepted, the differences between the groups being quite marginal.

With regard to relative changes between the groups from six weeks to ten months the ANCOVA F-value again revealed no significance.

FIGURE 8.18

SUMMARY OF RESULTS FOR LARGE AND SMALL SCHOOL GROUPS ON CRITERION MEASURE: PREFERRED ACTIVITIES (INTELLECTUALISED)



Comparison after six weeks

t-value = 0.65; P > .10; df = 18

Decision: Accept null hypothesis
Difference after six weeks is not significant

Comparison after ten months

t-value = 0.18; P > .10; df = 18

Decision: Accept null hypothesis
Difference after ten months is not significant

Change from six weeks to ten months

ANCOVA F - value = 0.01; P > .10; df = 1 and 17

Decision: Accept null hypothesis
Relative change is not significant

19. Discussion of Hypotheses 3.6, 6.6 and 9.6

Figure 8.18 summarises the results obtained from testing Hypotheses 3.6, 6.6 and 9.6 concerning the differences between, and relative changes over time in Large-school and Small-school groups measured on preference for intellectualised activities.

Comparison of the groups six weeks after commencement of the school year indicated no significant difference. Compared ten months into the school year there was still no significant difference.

In terms of relative change over time between six weeks and ten months, no significant change occurred. Both the low ANCOVA F-value and the identical means at second testing (when adjusted for the results of the first testing) lead to the conclusion that preference for intellectualised activities did not vary according to the Large or Small schools in which the groups occurred.

20. Precis of Results

20.1 Open and Traditional groups

Open groups were significantly more positive in their attitudes to high school ten months after the commencement of the school year than were Traditional groups. However, this significant difference which had developed steadily from earlier in the year was due not so much to the Open groups becoming more positive as it was to the Traditional groups becoming progressively more negative while the Open groups remained stable.

Open groups were also significantly more interactive and collaborative when engaged in work-associated tasks than were Traditional groups. Because this difference was evident on both testing occasions, while the relative change over time between the testing sessions was not significant it can be postulated that the endeavors of teachers in Open groups to create environments in which students would become more reliant on each other and less dependent upon teachers, were effective quite early in the year.

The Open groups were also significantly different from the Traditional groups after six weeks with respect to performance on a creative task. This difference however, unlike the previous instances, was not in the direction generally predicted by advocates of Open Education, the Open groups performing significantly worse at the task than the Traditional groups. By the time of the second testing session the difference between the groups was no longer significant, the Traditional groups having deteriorated very slightly while the Open groups improved at a relatively significant rate.

The Open and Traditional groups were not significantly different from each other at either testing session, nor did they change over time in respect of preference for activities involving change or sameness, autonomy or dependence or for intellectualised activities.

20.2 Metropolitan-based and Rural-based groups

Classified according to metropolitan and rural location, the Metropolitan groups were significantly more positive than Rural groups in their attitudes to high school six weeks after the commencement of the school year. Although they did not improve at a relatively significant rate up to the second testing program, the Rural groups had become sufficiently more positive in their attitudes for there to be no longer any significant difference between Metropolitan and Rural groups.

With regard to collaborative behavior and performance on the creativity tasks there were no significant differences or changes observed. However, persistent significant difference appeared to exist between the groups in respect of preference for activities involving change or sameness, the Metropolitan groups displaying significantly greater preference for activities involving change. At the same time there were no significant differences between the groups in terms of preference for intellectualised activities and activities involving autonomy or dependence.

20.3 Large-school and Small-school groups

In general, groups could not be differentiated according to whether they were housed in Large schools or Small schools. The one exception occurred in respect of activities involving change or sameness where, relative to each other, the groups from Large schools underwent significant change between six weeks and ten months in the direction of greater preference for activities involving sameness.

CHAPTER 9

A CASE STUDY OF ORGANISATIONAL FACTORS MODIFYING THE EFFECTS OF OPEN GROUPS

Introduction

In the previous chapter, statistical methods were used to assess certain aspects of student performance in Open and Traditional groups. The unit of analysis was the identifiable class or group. The present chapter, by use of case study methods, considers the organisational factors that might act as modifying influences in the achievement of desired effects in Open Education programs. The school is taken as the unit of analysis because the administrative strategies and organisational structures employed throughout a school as a whole create a work environment from which the Open Education groups should not be dissociated.

For the most part, the discussion deals with the schools in groups of five under the following labels:

(a) Included Open group schools; that is, those schools that claimed to have Open groups and which appeared in the upper left quadrants in Figures 5.1 and 5.2, and which were used in the preceding statistical analysis.

(b) Excluded Open group schools; that is, those schools that claimed to have Open groups but which did not appear in the upper left quadrants in Figures 5.1 and 5.2, and which were not used in the preceding statistical analysis.

(c) Included Traditional group schools; that is, those schools that claimed to have Traditional groups and which appeared in the lower right quadrants in Figures 5.1 and 5.2, and which appeared in the preceding statistical analysis; and

(d) excluded Traditional group schools; that is, those schools that claimed to have Traditional groups but which did not appear in the lower right quadrants of Figures 5.1 and 5.2, and which were not used in the preceding statistical analysis.

Figure 3.2 in Chapter 3 above serves as the main reference point for the concepts used in this case study.

The main task is to examine the extent to which the schools housing Open groups became more amenable to innovation (if at all) than other schools. Earlier it was suggested that the organisation least amenable to innovations such as Open Education was likely to be a service organisation (in terms of Blau & Scott). The organisation most amenable to innovation was likely to be a business organisation operating with a highly organic management system and capable of developing a multi-skilled team approach in achieving its aims. In the present analysis, comparisons will be drawn between the included Open group schools and other schools when necessary.

In all, 20 principals, 80 teachers, 80 students, one advisory council chairman and approximately 20 parents were interviewed individually or in small groups for the main parts of the case studies. However, two principals and four students from schools not included among the 20 main schools were interviewed for information contained in Section 3.3 of Chapter 10.

Some of the information obtained from parents was gathered at public meetings which the author attended. The advisory council chairman simply asked to be interviewed.

1. Management Systems

From a management point of view, one important characteristic shared by the five included Open group schools was that each involved its entire student and staff populations or the vast majority thereof in the innovative programs. In the excluded Open group schools it was usual to find Open and Traditional environments operating side by side, with the majority of students and staff engaged in the Traditional programs. Hence, the tendency was for the first group of schools to be managed on a system consistent with the aims of the innovation while the schools in the second group persistently encountered conflicts of management style between the requirements of the Open programs on the one hand and the Traditional programs on the other. These management conflicts were manifest between staff generally and, as well, were conducive of intra-personal stress in principals. Four of these five principals expressed the view that they were unwilling mediators of staff factionalism. As one reported, "... being boss of this place is like nursing a keg of dynamite in a bushfire!"

Because the excluded Open group schools implemented Open programs on a relatively small scale they were viewed by principals, staff, students and parents as primarily Traditional schools that were endeavoring to innovate cautiously and, they felt, responsibly on a small scale before committing their schools *in toto* to a set of ideals, procedures and presumed educational effects that were largely unpredictable. This issue is elaborated further in Chapter 10 under the heading of Divisibility.

The included Open group schools, taken together, displayed a variety of behavior indicating a shift away from mechanistic management systems, in the directions represented by the arrows in Figure 3.2.

Management of these five schools had become, at all levels, more organic in structure. For example, principals had delegated authority and responsibility to more junior members of staff and, furthermore, had demanded the right to shed and share much of the day-to-day management activity necessary to keep the schools operating. In terms of making decisions and implementing them, individual members of staff were accorded direct responsibility for their own actions and, in consequence, found it necessary to become answerable to meetings of their peers (usually including the principal) in which they took part both as the critics and then as the criticised. Three instances were noted where the principals themselves assumed teaching responsibilities in collaboration with fellow staff members, but in each case these teaching responsibilities were founded on ability to provide particular expertise. In this sense they differed from many of their Traditional colleagues whose adventures back to teaching duties were often based on covering up a shortage of teachers or on the more dubious ground of simply wanting to "... keep a finger on the pulse of all the undercurrents that a principal might otherwise miss out on knowing about."[1]

In some respects, however, the principals in both sets of schools where Open groups were claimed to exist, were uniformly unsuccessful in the business of shedding and sharing responsibility in management. This was evident in two main areas. In the first place, legal requirements of the relevant Education Act and Education Department Regulations demanded that certain actions were required to be performed by principals and in fact, despite the widespread acknowledgment throughout Victoria's high school network that special conditions prevailed in these schools, the Education Department continued to conduct its relationships with the schools through the appointed principal who was still seen as the basic decision-maker.

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[1] From an interview with the principal of one of the included Traditional group schools.

These external relationships meant that much of the attempt to shed and share responsibility was unreal. While relationships with the Education Department and other outside bodies flowed smoothly, authority and responsibility could be shared around the school. But in terms of the great majority of legislative requirements in Victoria which remained unchanged, such innovative administration tactics could be dysfunctional. In times of trouble (for example, when a student was caught shoplifting at a time which the self-service store manager considered should be treated as school time) the principal would simply be forced into assuming the position, role and status which outsiders traditionally expected of him.

The second area in which principals were rather unsuccessful in their attempts to share responsibilities concerned the Education Department practice of appointing teachers on grounds of seniority rather than suitability. Teachers who applied for schools simply in order to obtain promotion could easily find their work lives dominated by Open groups in which they had little or no interest. Eight of these principals claimed a total of 23 such teachers between them. Typically, the principals would be forced into action either to help integrate these teachers or at least to prevent them from working actively against the innovation. Even when such teachers entered the innovative programs with great willingness they tended, more than other teachers, to suffer from temporary disillusionment and from feelings that the program was demonstrably a failure. Again the principals would find leadership roles demanded of them in the process of rebuilding morale.

Apart from the requirements of law and the problems of morale of teachers, principals in all ten of the innovating schools were faced with occasional demands from three other groups. First, there were the students themselves who, in comparing their school lives with those of their neighborhood friends, reported suffering from wide fluctuations in their beliefs about the value of the educational experiences in which they were involved. Secondly, there were parents groups and advisory councils who continued to see the principal as the virtual sole arbiter of what was to be done in the school; hence, whatever was seen to be wrong could only be corrected by "a show of strength by the principal."[2] Thirdly, there were 'outsiders', members of an amorphous general public who wrote to newspapers, to directors of education, to local members of parliament and to principals, complaining that the schools were no longer providing traditional authority and discipline, a lack often said to be the inevitable consequence of loose and weak management![3]

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[2] From an interview with the Chairman of the Advisory Council in one of the excluded Open group schools.

[3] For example, see articles by Frank Just in the Melbourne Herald 22nd May, 1972 and 30th May, 1972.

In each of these cases, principals would find themselves forced into a position of defending and protecting the innovations and, in at least two of the five included Open group schools, into a position embracing contradictory roles. Within the school, a principal might be quite open, sharing, democratic and reliant upon his more junior colleagues. At the same time he might act in a highly authoritarian manner towards those who seemed likely to threaten the continuance of the innovation. One principal, for example, controlled entry of visitors by laying down quite strict conditions about minimum duration of visits and about acceptable modes of behavior of visitors.

The extent to which organic management systems were implemented can now be examined in detail, keeping in mind that, whatever relatively organic management systems had been implemented (by comparison with the other sets of schools), the included Open group schools were still subject to the kinds of pressures outlined above.

In each of the five included Open group schools considerable change was afoot, not simply of the once-and-for-always revolutionary type, but of the constant, ongoing evolutionary type. Conditions arose persistently in which unanticipated consequences and new problems had to be confronted and even deliberately sought out. In the remaining 15 schools predictable stability appeared to be the aim; even when an innovation was introduced the hope was often expressed that "... things (might) settle down quickly so that we can get on with the job."[4]

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[4] From an interview with the principal of an included Traditional group school.

Secondly, in the former group of schools, the manner in which teachers (including the principal) worked together was largely determined on the basis of the special knowledge and skills which each member of the teaching team was able to contribute. Particular tasks, or even a different approach to a whole set of tasks could be arranged in a meeting of the relevant staff members, and tasks assigned by the group on a basis of potential contribution. In one school, for example, a science/mathematics teacher was selected for (and agreed to perform) consulting duties, mainly with other teachers, so that scientific aspects could be introduced into whatever projects or investigations were generated by other teachers.

In all cases there was evidence of generalised acceptance of responsibility, particularly with respect to the direct handling of students' problems. Instead of problems being referred to higher authority, their handling was usually attempted on the basis of an attitude expressed by one teacher as "... the buck stops when it reaches me." Where possible, this attitude also permeated relations between teachers and parents because, for most practical purposes, parents were able to visit the schools at any time without reference to the principal and deal directly with any teacher in discussion of a child's problems and development.

Not surprisingly, this generalised assumption of responsibility led to quite complex networks of control, authority and communication, involving not only responsibilities to be undertaken by individual members of staff but by individual students as well. Indeed, in all five schools self control, self-discipline and preparedness to communicate one's problems wherever one thought appropriate, was placed squarely in the hands of the students. For the most part, these networks led to effective day-to-day operations but achieved only mixed success when behavior problems and personality clashes occurred. From teachers' statements and researcher observation, it appeared that such issues faced better prospects of resolution through an open management structure only when sufficient time was given over to the task by all concerned. In fact, time was often a major problem.

In the Traditional groups with mechanistic structures of control, authority and communication, unilateral decisions could be made in the handling of problem behavior and personality clashes; that is, control, authority and communication could be exercised with great speed when necessary. The more open, organic structures, however, often involved the expenditure of a great deal of time by members of staff, some of whom found themselves in a seemingly endless round of human relations exercises at the expense of the educational programs. Of course, there were those teachers and students who considered such human relations activities to be an integral, if not the most important part of the growing child's educational or 'life' experiences. For other teachers in Open groups, however, the inefficiency of the open management networks in producing fast solutions[5] to behavior problems and personality clashes proved frustrating and, in some cases resulted in lowering of teacher morale and in disillusionment of students who came to question the extent of teachers' rights and obligations to intervene in such matters.

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[5] 'Solutions' should be taken here to include repression as well as resolution.

Hence, these open management systems could be characterised by lateral interactions between all participants, usually without reference to levels of authority, provided that such interactions were relatively free of crises. When crises did occur, the teachers and students from the included Open group schools, having undergone more extensive preparation, said that they preferred to cope within the framework of open management structures while those from the excluded Open group schools more often said they preferred to increase controls in order to cope.

Furthermore, it was particularly evident in the included Open group schools that higher prestige was attached to expertise, knowledge, a worldly orientation and good human relations skills than to position in the narrower Education Department hierarchies. Therefore some teachers who were seen to be worldly and competent in human relations were actively sought out by students and other teachers.

The included Traditional group schools presented many classical signs of mechanistic management. In all five cases, the principals retained positions that can be described in two ways. Firstly, they were pivotal positions in so far as information both from sources internal and external to the schools was directed through the offices of the principals. Secondly, from the point of view of decision-making they were the top positions in bureaucratic pyramids. In each school, control, authority and communication were functionally related to a hierarchy which ranged between the most junior students and the principal. Hence, positions and status in a hierarchy were major determinants of the occurrence and quality of interpersonal interactions. For example, principals were referred to by titles and surnames by all members of staff and, as though to emphasise separation of statuses below the level of principal, the most senior members of staff might be invited to breach this general rule outside of school. The same kind of hierarchical arrangements operated at the level of student interactions where the prefect system was used as a point of referral before certain matters would even be attended to by a member of staff - much less a senior member of staff or the principal. In one such school, an instance of problem behavior in the school grounds would be referred to the prefects and, if necessary, upwards to two other positions before referral on to the principal.

A high degree of task specialisation in these schools was evident according to position in the status hierarchy not only in professional matters (an area from which it was sometimes curiously absent) but in organisational support tasks such as the placing of one teacher in charge of 'yard duty', one female teacher in charge of 'girls' discipline', one male teacher in charge of 'boys' discipline' and in one case, even a teacher in charge of announcements to be made over the public address system.[6]

Some evidence was also available in these schools to suggest that greater prestige attached to local, intra-school knowledge and experience than to cosmopolitan knowledge and experience. This evidence took the form of direct statements made by staff and students expressing doubts and suspicion about teachers seen as different - teachers who had come from other countries or teachers who had, at some recent time, left the security of employment with the Victorian Education Department to travel or to work in another job environment. Hence, the tendency was for prestige to attach to those who had remained in the system and had directed their energies towards day-to-day administrative and organising duties or to prestigious extra-curricular activities. Teachers from this latter group also saw themselves to be working harder and more seriously than their more cosmopolitan colleagues who were described by one stalwart as "... professional drifters".

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[6] A teacher whose fury knew no bounds when the principal himself frequently breached the arrangement.

In the case of the excluded Open group schools there appeared to be more management problems than were evident in either the included Open or included Traditional groups.[7] In part, this may be attributed to a lack of understanding of the need to support the innovation of Open Education programs through the establishment of open, organic management systems. In three instances the management systems remained unchanged from the days preceding innovation. During interviews, principals and teachers were inclined to express surprise that the system of management could have any material bearing on the success or otherwise of Open Education programs. The principal of one school received a nod of approbation from his deputy principal when he said "... You hear people talk about running schools more democratically but in fact it doesn't work and we are not about to waste time trying!"

In essence, one major difference between the intended management systems of the included and excluded Open group schools was that in the case of the former, deliberate attempts were made to co-ordinate the management system with the innovation (albeit with mixed success) while in the case of the latter, virtually all school management activities were allowed to proceed quite independently of the innovation.

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[7] Based on observations of the researcher and on comparisons of statements made by teachers as to the manner in which administrative problems should be overcome in high schools.

In these same terms the most noticeable difference (to the present author) between the included and excluded Traditional group schools was the way in which the management system was used. On paper, there might be little to choose between the two groups. In practice, however, the former tended to make the system work relatively impersonally and functionally in terms of the general organisation of the school, while the latter used the management system dysfunctionally or even ignored it whenever personal relationships appeared likely to provide a more adequate vehicle for getting things done. That is, the excluded Traditional group schools showed many of the characteristics of the included Open group schools and were in many ways more open in their approach to management than the excluded Open group schools.

2. Type of Organisation

In Chapter 3 the question was raised as to whether it might be possible to develop a school that could adapt for innovation by changing the nature of its prime beneficiary relationships so significantly that it would cease to be classifiable only as a service organisation (in terms of the Blau & Scott typology).

In this section the main task is to examine the extent to which prime beneficiary relationships in the Open group schools changed significantly, if at all, in the direction (indicated in Figure 3.2) necessary to increase amenability to innovation and, hence, greater likelihood of intended effect.

In a typical service organisation the main feature is the provision of professional services about which the professional retains considerable responsibility to decide what is best for the client (Blau & Scott, 1962:51). A major difference between the benefits obtained by the clients of a service organisation such as a school and those obtained by the clients of other organisations therefore is that the former are judged to be unqualified to determine what is in their own best interests while the latter have a say in the fact of and nature of the benefits they derive (Blau & Scott, 1962:52). But even among service organisations many schools hold a special place in that compulsory attendance laws are applied up to some statutory leaving age,[8] hence the student/client may not even have the right to withdraw from the professional services from which he is supposed to benefit, even if he wants to do so.[9]

The five included Open group schools could be distinguished in greater or lesser degree from the remaining 15 schools in that they evidenced some movement in the direction of the mutual benefit type of organisation. Consideration must be given as to whether these shifts were likely to be:

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[8] In the State of Victoria compulsory attendance is applied until a student reaches 15 years of age.

[9] Of course, it might be argued that the student is not really the client anyway. Perhaps the parents/guardians or the public-at-large are really the clients. In one of the included Traditional group schools, a senior teacher suggested that, in terms of professional services, the student's relationship to the school is somewhat akin to that of a pet dog to its veterinary surgeon.

(a) educationally or socially significant; and/or

(b) permanent.

The potential areas of increased power for students in their relationships with teachers appeared to be two in number; the determination and management of the general aims of the school, and the determination of methods and content to be adopted in the educational programs. With respect to the first of these, students appeared to increase their general control powers to no greater an extent than would be expected of patients in a hospital or prisoners in a gaol who might be delegated the occupationally therapeutic task of arranging their own social activities. Where students were involved in any attempt by principals and staffs to implement democratic control they were, without exception, able to articulate the boundaries within which their influence would apply and the circumstances under which the teachers could breach the agreement at will, with the connivance of the students. For example, one student observed that "... teachers get paid to argue with the Education Department; we don't!" His rather more articulate girlfriend, with all the maturity that she could muster on her 12th birthday was more pointed: "The teachers always come up with better rules than the kids ever do. We are too strict. Then nobody follows the rules. Some of my friends call the Students' Representative Council 'The Warders'."

Comments by teachers simply confirmed this view. For example, "... we let the students make rules but we reserve the right to veto them", and "... I guess we run a guided democracy here. The hardest job is to convince students that unwritten, agreed codes of behavior will always be more effective in the long run than pages of written aims and rules." Hence, in the Blau & Scott terminology, the clients were allowed to participate in the professional tasks associated with school policy and management provided the professionals were likely to have made the same decisions anyhow.

By comparison, the counterparts of these students in the included Traditional group schools certainly exercised fewer and less important determinations over school policy and management. Generally speaking, in these schools professional decision-making about the best interests of the clients reflected somewhat the view that the child was not the sole client of the school because considerably more overt attention was paid to custodial behavior by teachers and to teachers' obligations to make direct interventions in the socialising of a child towards 'good citizenship'. In the Open groups there was much heavier emphasis (stated and observed) on schooling for intrinsic benefits which the child might derive. Presumably, one benefit would be practice in making organisational decisions, even if such decisions were virtually confined to the level of simulation exercises.

With respect to the second potential area of increased power for students - that of determination about the methods and content in educational programs - the included Open group schools were considerably more successful in involving their clients in substantial decisions. To some extent unfettered by conventional syllabuses,[10] teachers expressed greater willingness to act as consultants for students who had already taken decisions to pursue particular lines of enquiry. Indeed, one of these schools had, without recourse to the psychological or sociological literature or terminology, attempted to define its educational programs in terms of mutual benefit for both students and teachers; that is, to have the teachers derive educational and socialising experiences in their own right, as well as deriving the more usually lauded teacher benefits of salaries, job security, high morale and job satisfaction. In this school it was common for teachers to participate along with students in lectures or seminars organised by teaching colleagues or by groups of students who had acquired specialised knowledge in some area (e.g. botany).

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[10] See Chapter 10, Section 2.3.

In terms of mutual benefit, this arrangement provided a useful forum for active minorities who were willing and able to contribute to a program or, perhaps, to design a program.

Client involvement in the curriculum was much less noticeable in all of the included Traditional group schools. Pre-determined syllabuses were common and whatever flexibility was built into those syllabuses to allow choice on the part of students tended to be restricted to the detailed strategies of project and assignment preparation. The rationale for such restriction was suitably summarised by one teacher: "Of course I feel obliged to determine the syllabus; Form 1 children don't even know how much they don't know. I don't believe they would know where to start."

Up to this point possible changes in the nature of prime beneficiary relationships in the included Open group schools have been considered in terms of a shift towards the next most amenable organisation type, the mutual-benefit association. The question still remains as to whether changes occurred even further, towards the prime beneficiary characteristics of commonweal and business organisations.

The commonweal organisation is distinguished from other types in that its prime beneficiary is the public-at-large and in that it is controlled externally by democratic means while at the same time being controlled internally by bureaucratic means.

None of the excluded Open, included Traditional or excluded Traditional group schools displayed any organisational characteristics typical of this type of organisation; nor did three of the included Open group schools. The remaining two schools had attempted to gain identification in the community as community schools that were open to public involvement, public scrutiny and to public meetings at which even particular aims and methods could be recommended to the staff for attention and action.

In one of these schools, for example, recommendations about inclusion of sessions on drug dependency in the curriculum, were a direct result of a vote taken at such a meeting. However, in the sense that the school staff were not technically or legally obliged to act on such a vote, this exercise in democratic control should probably be labelled as quasi-commonweal.

In the other school, a quasi-commonweal feature could be seen in the extent to which bureaucratic internal control was subsumed under a kind of external democratic control. In this case, the principal disengaged himself from most of the administrative control tasks in the school, passing these matters over to a senior clerical person (a bursar), and leaving himself and his staff "... to get on with the real stuff of education". Although some teachers bravely asserted that this system worked efficiently for the most part, no really adequate demonstration of this efficiency was observed during the study.

Thus, with these rare, and somewhat dubious exceptions in mind it seems fair to suggest that amenability of the 20 schools to innovation was not particularly enhanced by any adoption of commonweal organisation characteristics.

With regard to the business organisation, Blau & Scott (1962:49-51) observe that the clients (i.e., the persons who buy goods or services) are subject to the vagaries of self-interest shown by the owners of the organisation.

To the extent that three of the five included Open group schools had attempted to move away from custodial, _in loco parentis_ relationships between teachers and students by encouraging children to make their own educational decisions and self-disciplined decisions about behavior, some semblance of the business principle of _caveat emptor_ might have arisen. That is, a shift towards emphasis on freedom of decision and action and away from constriction, probably meant that students faced the prospect of entering programs that they would quickly dislike or which they felt to have little educational value.

One student who seemed happy with this business-like freedom reported thus: "I went along to Group A's presentation on 'Sound in Our World' but all they talked about was their favorite pop. records. My group did some beaut. things with amplifying gear and it was a lot better." Another student, less enamored of the freedoms available in the same school, recorded her displeasure with the comment, "... we really would waste a lot less time if the teachers just told us what to do and we went off and did it."

In terms of amenability to innovation, considerable variety was obtained in the three schools, but for short terms only. It would not be too crude an explanation to suggest that this spasmodic effect arose because the 'buyers' quickly became disillusioned by the general poverty of the educational market. Sessions were often poorly attended, ignored or strongly criticised because of this disillusionment. In short, a strategy that might have been expected to be conducive to innovation proved dysfunctional because it was poorly executed.

3. Interpreting Results in Terms of the Model of Amenability to Innovation

Teachers, principals and educational researchers may know and experience a great deal about the school as an organisation, developing a high degree of sensitivity to different teaching methods, subject matter and control strategies. However, their perceptions and perspectives on organisations tend to be limited to schools and education departments to the exclusion of other organisations. Systems of management in schools are often thought of as bearing no particular relation to the systems of management employed in organisations other than the school.

This observation may not be quite so contentious as it first appears. Generally speaking, comparative studies involving schools, and training courses or conferences of teachers tend to seek out differences between some aspect or other of schools, and in the process ignore the similarities between schools. A possible advantage of combining the Burns & Stalker and Blau & Scott models into a bridging model of amenability to innovation is that the school may be placed in a little broader perspective among the entire spectrum of organisations, their types, structures, processes and management.

Seen through this broader perspective, it would be difficult to sustain an argument that other than quite limited movement had occurred among schools in the present study, along the prime beneficiary or management dimensions. As described, the management systems in the included Open group schools became more organic, and yet many of the mechanistic management characteristics evident in the included Traditional group schools remained or were quickly resumed under pressure of such conditions as contrary parental expectations and the unchanged State legislation and Education Department regulations. The changes both in management systems and prime beneficiary relationships in the two sets of Open group schools appeared to be limited even further by the perceptions of teachers, parents and students. No judgment is offered here as to whether this is a good thing or a bad thing.

A further reason that might be proposed to explain the limited shifts along either dimension was the continued inability of most of the Open environment schools to formulate and evaluate the achievement of educational goals. As long as this problem existed it was difficult for anyone to judge the success or otherwise of particular programs and consequently whether there was any real point in making more extreme changes in the structure and management of the organisation.

In making judgments about the extent of movement along either of the dimensions, a basic problem is raised regarding the nature of evidence. What is accepted as reasonable evidence and what is accepted as reasonable interpretation depends largely on the orientation of the observer. Similarly, interpretation must depend upon acceptance or rejection of particular statements and expressed attitudes of the participants in a study as indicators of the concepts which the observer considers central to the phenomenon under investigation.

A second issue concerns the notion of significance. Does an observed difference or claimed difference represent a significant difference in the sense of real educational and organisational difference or does it merely indicate a good feeling among participants and observers that such differences as they perceive have important educational consequences? It is conceivable that participants and observers might feel and assert very strongly that major changes are afoot. Whether or not it is possible to support such feelings and assertions with descriptive and inferential statistical evidence these feelings may be important in their own right while overall or specific educational differences (say, in terms of student behavior) may be negligible.

An alternative question is: Does the absence of a significant difference (in terms of whatever perspective is chosen) also mean that any just noticeable difference is unimportant?

Although the present case study cannot be used to offer conclusive answers to these questions, certain tentative comments may provide a few insights into the modifying effects of organisational type and management system on observed student effects and on possible directions of further research.

The schools in the included Traditional group category were not even engaged in any pretence of operating other than professional-dominated organisations backed by mechanistic management systems. Yet many of the educational consequences of their programs did not appear in one year to differ greatly from the consequences of programs purporting to be more open in orientation.

If the four sets of schools are compared on the basis of the expectations which they held for their programs, the matter of success orientation becomes important. Three groups, the included Open, the excluded Traditional and the included Traditional appeared to be similar in this respect. The first group expressed considerable satisfaction in having moved away from (and survived) conventional organisational characteristics and management procedures. The second group considered themselves highly successful in that, still using fundamentally mechanistic management systems and traditional professional/client relations, they had been able to introduce friendly, humane environments that created high levels of work satisfaction for both staff and students. The success orientation of the third group can be summed up in one principal's naval idiom: "Whatever else people say about my school, they all agree that we run a good, tight ship here."

The remaining set, the excluded Open group schools more frequently found themselves unsuccessful and frustrated in attempting to alter relationships among students and staff and more prone, when even mild disruptions occurred, to display concern about the future of the new structures and methods.

Expressing this comparison a different way, it can be suggested that the included Traditional group schools were not trying to be different, the excluded Traditional group schools were not particularly expecting to achieve anything different but were often pleased to see their best expectations more than met, and the included Open group schools frequently expressed feelings that they were achieving significantly different outcomes with their students and greater job satisfaction and morale than could be achieved elsewhere. (Of course, the question of whether actual differences matched the feelings of difference is not at issue here.)

Yet in the excluded Open group schools there was a greater tendency to expect difference, and hence to experience greater disillusionment at the failure of the so-called experiments.

Nevertheless, if it was true in a broader organisational perspective, that the educational differences arising from changes in professional/client relationships and in management systems were not particularly important, two questions still require further examination. In the first place, it is possible that the effects of Open groups require a longer period than ten months to become evident. This view has a certain logical appeal about it, because although it is possible to re-write the professional/client relationship and the management structure of a school from one day to the next, the actual behavior of the people involved may not change greatly in a short time. Indeed, expectations of people might change while the actual behavior of those same people remains fundamentally unchanged.[11]

Secondly, it is possible that the supposed changes in management system and professional/client relationships could be counted successful simply because they led to teachers feeling good; as though teachers were actively changing an education system which, until recently, had seemed unchangeable. Perhaps the first stage in the game of producing real change in organisations such as schools is for the players to learn about and experience the art of the possible.

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[11] Further consideration is given to this point in Chapter 10.

CHAPTER 10

A CASE STUDY OF THE MODIFYING INFLUENCES OF INNOVATION CHARACTERISTICS ON OPEN GROUPS

Introduction

In Chapter 3 it was suggested that the innovative nature of Open Education would be likely:

(a) to mediate between the pursuit of anticipated outcomes and actual outcomes; and

(b) to generate unanticipated outcomes.

The characteristics of relative advantage, compatibility, divisibility, communicability and complexity were proposed as a suitable theoretical base for consideration of these issues.

As in the previous chapter, case study methods are used to examine the influence of these innovative characteristics, taking either the school or an identifiable group or class as the unit of analysis, whichever is appropriate.

1. Relative Advantage

Relative advantage is "... the degree to which an innovation is superior to the ideas it supersedes" (Rogers, 1962:124). As was suggested in Chapter 3 the nature of the innovation will determine whether relative advantages are social, economic or political. The interests of the innovators themselves should determine, in part, whether the assessment of relative advantage should focus on productivity factors and/or on individual perceptions.

There is a point, however, which does not emerge in Rogers' somewhat aseptic definition of relative advantage. The background outlined in the early pages of this study describes a crisis situation in which failure, alienation and student action created pressures on both teachers and administrators. In this state of readiness or predisposition to change prevailing roles, curriculum content and methods, these teachers and administrators, along with various consultants, were triggered into action by a series of staffing and accommodation crises which, in some cases, were of sufficient magnitude to ensure that particular schools would no longer be able to carry out a wide range of traditional educational practices.

Nor is it surprising that crisis should lie behind an educational innovation in the way that is suggested here. Sutherland (1959) and Mulford (1959) in economics, Wilkening (1953) in rural sociology and Adler (1955) in education all found relationships between some crisis or other and the rate of adoption of an innovation. If one takes this point to the next obvious stage it is clear that Rogers' definition is aseptic in the sense that he discusses relative advantage in terms of an entirely positive connotation, whereas arising as it does in consequence of the vagaries of human behavior and perception, relative advantage can be characterised by quite negative connotations.

In several of the schools in the present study, the question was not so much one of positive relative gain but rather one of the relative disadvantage in not acting. In the following discussion relative advantage is divided into three sections; firstly, general relative advantage, secondly, specific relative advantage arising from low or moderate crises and, thirdly, specific relative advantages rationalised as a result of quite severe crises.

1.1 General relative advantages

The first general relative advantage identified by both the included Open group schools and the excluded Open group schools concerned control of the curriculum. From the time of the establishment of the Curriculum Advisory Board in 1966 and, more particularly, from the time of the Burwood Seminar in 1968, principals and teachers from these schools were actively encouraged by the Director of Secondary Education to acquire local control over curricula and to exercise their own professional judgments in deciding what should be offered to students rather than to depend on curricula imposed from sources outside the school. This encouragement was backed by the abandonment of certain external public examinations, the key one being the Intermediate Certificate examinations administered at the end of the fourth year of high school education. These examinations had tended to articulate curriculum content and method, and both the Curriculum Advisory Board and the Burwood Seminar had stressed that their abandonment was essential to gaining at least four years of general education without the disadvantages of a highly competitive academic environment. Teachers were assured that future examination procedures should be based on diagnosing areas of weakness and on remediation of those weaknesses rather than on selection (and reciprocally, exclusion).

The second general relative advantage involved association with high status individuals. The movement towards more open curricula and organisation structures, sponsored as they were by high status individuals such as the Director of Secondary Education, at least gave the appearance of offering improved status to those teachers and principals who innovated and experimented. Indeed, no less a person than the Director of Secondary Education created a minor furore by delivering a warning about the dangers inherent in 'feckless innovation'; a warning interpreted by some to mean that statements of aims and evidence of solid preparation were absent from many of the new programs, and by others to mean that the top brass wanted schools to know that they knew the high status bandwaggon of 'experimenting' was superseding genuine need for educational change.[1]

These two general relative advantages could be observed in both sets of Open group schools in varying degree. However, they appeared to the researcher to be more overtly important in the excluded Open group schools where somewhat less effort was applied to working through the problems of the innovation and making it functional, where the prospects for continuance appeared to be lower and where the students had felt that the organisation of the school and the behavior of the teachers were not dramatically different from the conditions they had experienced in their earlier schooling.

1.2 Specific relative advantages arising from low crisis stimuli

The first of these advantages, also more common in the excluded Open group schools than the included Open group schools, centred around the practice of innovating in order to counter the claims of a competitor.

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[1] Teachers in the included and excluded Open group schools were asked what effect the attitudes of senior departmental officers would have on their own willingness to continue their innovations in the following year. Comments ranged from "... I will go on in spite of them", through "... no effect at all", to "... Reed's attitude is very encouraging". Eleven of the 20 teachers who commented made reference to Reed's remark in one or other of the terms indicated. In a personal communication, Reed recollected that this remark had been made at a conference of high school principals in the context "... conservatism is preferable to feckless innovation".

Competition could arise from newer schools which provided alternative programs for the same pool of students. One excluded Open group school, housed largely in buildings that had been installed on a temporary basis 20 years earlier, and boasting a high proportion of teaching staff who were entrenched locals, adopted Open Education programs following a staff meeting called to discuss public statements made by the principal, of a new and very much alive technical school in the same catchment area of students. The wayward statements implied that the high school was a comfortable educational backwater which fewer of the brighter students coming through the primary schools would now choose because of the exciting offerings at the technical school. The Open Education programs at the high school were justified on three specific grounds by the deputy principal during a staff meeting. In the first place, the introduction of more flexibility into curriculum content would substantiate the high school's own claims to relevance in the local (farming) community. Secondly, greater flexibility in class organisation would give an impression of modernity, enthusiasm and action in an environment otherwise characterised by old and dreary buildings. Thirdly, it would be educationally undesirable, in the community as a whole, for the technical school to maintain sole claim to novelty and initiative.

The second specific relative advantage arising from low crisis stimuli can be summarised as innovating to satisfy pressure groups. This practice occurred in those schools where enthusiasm for new educational ideas appeared to be greater among parent and community groups than it was among the staff of the school. Although the initiative for action by pressure groups usually lay outside of the teaching staff, there were two instances in which teachers, finding that they could gain no effective voice within the school acted as the main spurs to action for the relevant community service groups,[2] membership of which they enjoyed as private citizens. As before, this relative advantage appeared to be more prevalent in the excluded Open group schools.

The third specific relative advantage, which is more difficult to relate to a particular set of schools, concerned the innovating of Open Education programs for the purpose of generating change in the host community. Typically, there would be little opportunity of local employment for school leavers. Furthermore, the social activities of the adult community would focus more around an active community nearby than around the immediate vicinity. In the school in which plans had been best articulated, if not fully implemented, the principal and teachers recognised that one way to establish an active local community under these circumstances would be to have the high school operate as a community centre. The easiest way to achieve this would be to open the doors of the school for both children and adults, day and evening. The limited programs offered to adults during the present investigation created considerable local interest, and the more informal organisation necessary to make the school attractive to adults was being incorporated into the regular curriculum.

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[2] The pathway of influence in each case was found, on closer investigation, to be quite subtle. For example, both service organisations made reasonably regular donations of equipment which the schools could not otherwise afford. Furthermore, the chairmen were also members of the advisory councils of the schools concerned.

The one included Open group rural school acted on this kind of relative advantage. The township in which it operated was smaller and more stable than a nearby provincial town. There was no particular problem of close, local competition although several staff members lived nearer one of the active high schools in the provincial town than to the high school in which they taught. Both the principal and his deputy felt strongly that the township lacked initiative in many spheres. Anything of interest appeared to be happening 30 or 40 miles away, and local people travelled to be spectators and visitors much more frequently than they hosted their own activities.

Furthermore, this was a typical case of a district being unable to support most of the school leavers in local employment. The consequent movement of young people to the big cities produced an unfortunate aftermath which motivated the district to close ranks even further. Because it was a relatively closed community, feedback and gossip networks transmitted stories of former students of the high school who had moved out, failed elsewhere and then returned to their families as unpaid help or as layabouts. Conscious of this problem, the principal and a few interested teachers gave as much of their time as possible in aiding the social adjustment of students to the wider community, hoping that exit students would be able to cope more effectively in the world of work.[3]

Even the local taxi operator, in the course of transporting the small research team between the school and the hotel, offered his free opinion in support of the Open Education programs on the grounds that the district was backward, in need of a new image and in need of "... a good push into the second half of the 20th century".

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[3] These activities were carried out in collaboration with Education Department psychologists.

The fourth specific relative advantage arising from low crisis stimulus related to principals and teachers perceiving too comfortable an environment within their own school. Indeed, the view was expressed by several teachers that innovating Open Education programs simply for the sake of innovating was a good and sufficient reason. One principal, concerned over his appointment to a school that was free of serious operational problems, but which he considered parochial and slow-moving, introduced Open Education programs simply because they would be an innovation and might help to overcome prevailing boredom and lethargy. In this case, the fact of Open Education programs was secondary to the fact of innovativeness; because Open Education resulted in an injection of enthusiasm, its introduction was self-justifying regardless of whether any particular educational consequences resulted in terms of student performance.

1.3 Specific relative advantages arising from high-crisis stimuli

The first relative advantage arising from high-crisis stimulus concerned breakdown in organisational structure. In such cases, the relative advantage could be described in terms of an attempt to counter a breakdown in organisational structure and role performance. Two kinds of breakdown were apparent, the first resulting from initial crisis. This initial crisis occurred in one of the included Open group schools that could not function normally because of lack of accommodation and a shortage of teachers. Open Education could be manufactured from the 'grass roots' in order to allow sufficiently flexible grouping of students and staff so that the school could function where it might otherwise have been forced to close.

In this school, the absence of classrooms of normal size and the fact that only one teacher was qualified in mathematics and science was countered by abandonment of formal classes and adoption of 'topic studies' in which scarce teaching resources could be used on a consulting basis, with teachers moving from group to group or from child to child as the need arose. Because the main building in which the school was housed comprised one large open area, any attempt to conduct traditional classes would have been likely to generate serious teaching and behavior problems, not to speak of the difficulties which individual teachers might experience in having to maintain relative silence and control. In this school, said the principal, collaboration between students was not only allowable, it was essential.

The second kind of breakdown arose from crises of degeneration. Four schools so affected (two included and two excluded Open group schools) had suffered severe morale problems among staff and students. Buildings were in disrepair and the staffs had been deeply divided into factions; resignations had been frequent and had occurred in batches; student vandalism, general dissent among large groups of students and premature withdrawal from school had been common. Although faction fighting appeared to bear some relation to long-standing defensive manouvres by an old guard against any potentially powerful alternative group, the two most obvious cases observed in this study (the included Open group schools) arose from disagreement about the remedial measures considered necessary to stem the deterioration in the school. In each case, certain teachers had engaged in a self-defeating tactic of implementing ever more stringent rules while others had abandoned rules in an attempt to 'reach' their students. A third group had tended to vary behavior according to mood.[4]

Of the two most obvious instances which typified breakdown by crisis of degeneration, one had established Open groups because of a show of strength on the part of a new principal, while in the other case, a group of young and recently appointed teachers staged something of a coup. This latter instance was interesting in that the success of the strategy involved turning to advantage a state of affairs which the old guard saw as a disadvantage for the younger and newer teachers. In this school it was usual for the more senior and established teachers to associate their own status with heavy teaching loads amongst the senior students of the school and to associate low status with the teaching of junior classes. Not surprisingly, such a state of affairs played directly into the hands of younger teachers whose reference point for status acquisition appeared to reside in innovative behavior that could not have been mounted in the senior part of the school because of the risks involved for students preparing for external, competitive examinations. In fact the younger teachers showed guarded enthusiasm when they were continually 'beaten' into accepting heavy work loads amongst junior students. With the old guard of the school primarily occupied in the task of ploughing through externally articulated syllabuses of Higher Certificate subjects the younger teachers had cordoned off a section of the school, with the connivance of the principal, in order to conduct their experiment.

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[4] Both schools had been visited regularly by the author on behalf of the Psychology and Guidance Branch of the Education Department for some years prior to the commencement of the present study. The factions were observed over that period.

A former principal of this school, commenting on the success of the coup, could only complain that nothing of this order had occurred during his term of office, and confessed that, prior to his new appointment, he had considered asking the Education Department for an enquiry to be conducted into the staffing of the school.

The second relative advantage arising from high crisis stimulus related to a migrant problem. In two areas where there were substantial migrant populations the schools found that both language and cultural barriers rendered traditional methods of teaching and modes of control largely unworkable. In particular the need to educate non-English speaking migrants loomed as a relative advantage in implementing Open Education programs in schools where there was a shortage of teachers qualified to cope with the task of teaching English as a second language. In one such school, classified in the present study as an included Open group school, the task was made more difficult by the fact that many of the non-English speaking students were illiterate in their first language anyway. Open Education programs were adopted as a way of traversing language and cultural barriers because of the emphasis that could be placed on social interaction, group projects and the involvement of multi-lingual teachers.

The third relative advantage arising from high-crisis stimulus concerned the need for the school to cope with economic poverty and its consequences. Although not widely emphasised, this factor was mentioned as an advantage in two of the ten schools claiming to have Open groups, one falling in the included category and the other in the excluded category. In these schools, students who were often absent through illness, the need to earn an income or the need to care for younger siblings while parents were at work, were able to attend school at irregular hours, perhaps accompanied by a younger brother or sister, without causing inconvenience to the school or embarrassment to themselves. Provided the schools operated as open communities integrated with, rather than separated from the community at large, students could be incorporated realistically into the organisation on terms which took account of their general life styles. Official recrimination for breaches against the compulsory attendance laws was replaced by staff encouragement to attend when possible.

A number of issues emerge from the analysis thus far. In the first place, the dimension of crisis can play an important part in the relative advantages that motivate the adoption and diffusion of an innovation. Schools can be distinguished in terms of the motivations which underpin their adoption of an innovation such as Open Education and, consequently, they might be distinguishable in terms of the effectiveness with which they manage new ideas, new structures and new procedures. The relationship between crisis and rate of adoption has already been mentioned. However, a point of special interest in the present study is that crisis emerges as a factor in continuance of the innovation as well as in its initial implementation, in the sense that the groups emanating from more severe crisis appeared to be more intent on continuing. A third point is that the included Open group schools appeared to be characterised by one or more crisis advantages instead of non-crisis advantages such as 'jumping on the bandwaggon' or 'keeping up with the Jones'', which one principal considered at least three of the five excluded Open group schools to be engaged in.

The logic in these points may reside in the notion of expectations. The teachers in the excluded Open group schools clearly wanted the innovation to work but perhaps unconsciously or unwittingly endeavored to make it do so without any proposed parallel changes in the basic structure of their roles and their social relationships with the students. In the three schools accused of 'bandwaggoning' there was a defensive reaction from teachers who felt insecure about the changes and the consequences which a major innovation might have on their positions in the school. Whether the reactions were unconscious or unwitting is difficult to say, but the effect was one of protecting existing roles and structures at the expense of the innovation which, if necessary, would be distorted or scrapped. In the case of the included Open group schools taken together, there could be seen more severe crises. If a principal or teacher was faced with the prospect of arriving at school to take classes which could not meet because there were insufficient normal facilities in which they could meet, if the children could not understand him because of a language barrier, or if the children were simply not present at school, he would find that his normal expectations about teaching were untenable and would tend to alter his perspectives accordingly. Once used to the idea of innovating, tackling educational problems in a way that he may not have thought of before, altering relationships among colleagues and students, this individual was apt to give close attention to reading about, discussing and planning new roles.[5]

As witness to this difference between the included Open group schools and other schools, the use of professional libraries within schools can be cited. The principal of one of the included Open group schools, having spent a considerable sum of money on professional books, found that the pressure of borrowing was sufficient for him to make an arrangement with a local public library to have municipal library funds channelled into assisting with the demand for books and journals which the school could not afford. In addition, teachers in this school kept private professional libraries and organised a private loan system.

In one of the excluded Open group schools (and it should be remembered that these schools were claiming to be interested in new and different ideas) the difference was obvious. The principal of this school spent several hundred dollars in establishing a professional library from which one book was borrowed in the first four weeks of operation; and even then the problem of lack of use was only overcome because of the considerable soul-searching that resulted from a staff conference conducted by the staff education committee. Notwithstanding the soul-searching, the principal of that school, after ten months of the school year had elapsed, could have returned much of his prized professional library unmarked to the bookseller.

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[5] Teachers in the crisis-bound schools showed evidence of reading more professional books, and of meeting more regularly in formal and informal meetings with staff colleagues than did teachers in relatively crisis-free schools.

In summary of this point, it can be suggested that prospects for continuance of an innovation such as Open Education may be related to crisis to the extent that crisis forces better planning and motivates the abandonment of roles and organisation structures that are inappropriate or even damaging to the innovation.

2. Compatibility

Compatibility is "... the degree to which an innovation is consistent with existing values and past experiences of the adopters" (Rogers, 1962:126). Generally speaking, an innovation that is compatible should evoke fewer feelings of insecurity in potential adopters and will therefore be adopted more rapidly. Of course, insecurity is not essential to the notion of compatibility; many obvious instances can be imagined where the potential adopter simply does not care about the innovation or else associates it with a group to which he does not see himself as belonging.

The following analysis details three areas in which compatibility can be examined; teacher attitudes, student attitudes, and structural factors.

2.1 Teacher attitudes and experiences

The attitudes expressed by teachers in the present study fall into three categories. One group of teachers felt that the premises of Open Education as described in Chapter 5 above had been incorporated into their existing values quite readily. A second group expressed basically negative attitudes to Open Education. This group comprised many who had tried and failed, sometimes without any penetrating understanding of why they or the innovative programs had failed. A third group comprised teachers whose knowledge and experience with recent Open Education programs were limited to hearsay. Individuals in this group defined and discussed Open Education in terms of their own current feelings of disillusionment, satisfaction or dissatisfaction. Those teachers who were satisfied with their jobs tended to distort the practices of which they had heard to fit in with their negative views about any apparent need to change the system. Teachers who were more disillusioned than satisfied tended to glamorise the major tenets of Open Education and to hold expectations for the success of such environments beyond the realism expressed by those already working in them.

The attitudes of teachers who felt that Open Education could be incorporated into their existing values can be summarised thus:

(a) Open Education represents a humane approach to students. ("On rational grounds you know that you are doing the right thing for them as human beings ...").

(b) Open Education engenders warm and friendly relationships rather than constrained relationships. ("... there is much more room for the teacher to make use of his own personality characteristics; you can just be yourself ...").

(c) Co-operation between staff and students is far more productive than force. ("... you work with them instead of always fighting against them to get something done.")

(d) Open Education makes it possible to obtain a realistic diagnosis of a student's problems and needs. ("You learn a lot more about students than whether or not they can sit quietly in class. And if you know the 'whole' person you can diagnose his problems more easily. I always felt that children became ashamed if you tried to find out what they didn't know; now I feel as though they welcome my intrusion.")

Foremost among the attitudes of teachers who saw Open Education as incompatible with their values and experience were:

(a) Open Education promotes insecurity. ("You never know where you stand. Everything lacks regularity so you begin to doubt yourself ... you find the uncertainty a real strain.")

(b) Open Education is a disguise for permissiveness. ("... Critical colleagues ... think you are master-minding the permissive society. They treat you as though you are causing a decline in public morality.")

(c) Open Education is a haven for weak teachers. ("... they accuse you of having no control or discipline. Some of the teachers not involved in open classes think we are weak teachers because the students move about and generate a certain amount of high-spirited noise.")

(d) Open Education leads to a loss of protective social distance. ("Frankly, I pulled out of the scheme because the students get too close. They simply lose their respect for you if you don't keep a reasonable distance from them.")

2.2 Student attitudes and experiences

The manufactured product of an industrial organisation cannot complain and holds no attitudes. The school student, to the extent that he is the product of his school, is a very different proposition. Individually, he can destroy an innovation by not learning any better than he did before. Collectively, he can destroy it even more effectively by holding negative attitudes to it and by behaving in such a way that it cannot be utilised without undue difficulty. In respect of Open Education it seems that the compatibility of a student's attitudes depends on how much training and preparation is provided for him beforehand. (This view is consistent with the findings in Chapter 8.)

An important point, often overlooked by educationists, is that a student has perceptions of his role as a student no less than managing directors and politicians have perceptions of their roles. Although students were found to be resilient and quite flexible about their role expectations as students if trained for a change, they were no less rigid than many of their uninvolved, conservative mentors if not trained. The attitudes held about collaborating with fellow students on matters of school work, voluntary restraint on noise in excess of that required for small group communication, and preparedness to organise and take responsibility for much of their own programs all seemed to depend on how well informed they were about what the school was trying to achieve for them. With exceptions, the most general attitude amongst students who had been deliberately prepared can be summarised in the statement of one student whose express aim in life was to become a teacher: "All the good feelings of the staff run off onto the students. Sometimes it mightn't look like it but we know what we are doing." Where preparation of students was ignored, the negative attitudes of students were summed up in the comments of three dissatisfied students: "... we just muck around ...", "... nobody knows what they're supposed to be doing so the teacher just yells at us ...", and "... I just pretend to be busy." Parents of this latter group, anxious after gleaning such responses from their children whenever they sought information about progress at school, reflected these negative attitudes:

> "They do no work at all."
>
> "They just talk and fool around."
>
> "There should be more authority ... my boy does as he pleases."
>
> "What can you expect from the children when the teachers don't know what's going on?"

Students who still carried traditional roles and expectations in their minds, tended to see Open Education as a 'bad' or 'weak' version of Traditional Education.

Again a distinction could be drawn between the expectations held by students from the included Open groups and those from at least three of the excluded Open groups. While this distinction was not always sharp, the tendency was for teachers in the included Open groups, having been through the somewhat tortured processes of role revision themselves at a personal level and in concert with their teaching colleagues, to comprehend that the students and parents needed also to pass through a similar if not quite so profound a process. Two principals articulated this view in almost identical terms.

From this analysis it becomes clear that questions of compatibility ought not to be answered from a static state model in which incongruencies between the values or past experiences of adopters and the values and behavior demanded by the innovation are assessed, but rather, should be answered from a dynamic model which considers how much incongruencies are maximised or minimised through re-training programs.

2.3 Structural factors

At the organisational level, two aspects of compatibility arose:

(a) Successful innovation may be contingent on the degree of change required in curriculum content and method. For example, difficulties occurred in six of the schools claiming to have Open programs because of the inability of some teachers to overcome the 'one right textbook' approach to both content and method. In the first place, the wide variety of resource material required for Open Education could not be acquired as quickly as other organisational changes could be implemented. A data gap was created. Secondly, many teachers who had previously derived structure and content from an approved syllabus now turned, in the absence of that crutch, to textbooks that would simply replace the old syllabus. In this sense, incompatibility led to a dysfunctional consequence in the innovation: a few teachers who were freed from the old syllabuses so that they could tailor-make developmental programs, simply found an alternative externally structu[illegible]gram that removed the need of and the problems in developing programs based on their own professional expertise.

Two kinds of groups manifested this problem, the first being the excluded Open groups generally, and the second being those innovative environments into which a second generation of teachers had arrived (i.e., non-initiators who opted to join an innovative program after it had been established by somebody else).

However, to the extent that such incompatibility can be related to role insecurity and lack of new role preparation, there was a more subtle organisational factor operating as well. In Victorian secondary schools there has existed a long tradition of school/teacher inspection by Boards of Inspectors. These inspections served three main purposes: assessment of schools for the purpose of determining which among them should be approved to conduct their own internal examinations in lieu of presenting their students for certain public examinations; assessment of teachers for promotion purposes (and hence, for salary and status); and transmission of new and/or good ideas from school to school or from teacher to teacher. Clearly, if the inspectors retained either or both of the first and second purposes, incompatibility of the organisation with Open Education was guaranteed. After 1968 the power base of the inspection system in high schools underwent several changes which ought to have assisted in overcoming this area of incompatibility. Even so, one teacher who was supposedly co-ordinating the activities of an Open Education group, when told by his principal that a traditional syllabus would defeat the purpose of the exercise, produced one anyway. ("It's all very well for you, but the inspectors might ask for one. Where would I be then?")

(b) Successful innovation of Open groups must depend to some extent on willingness and capacity of teachers to change the systems of rules, rewards and punishments, and the habits which develop around those systems. Presumably, if logic were to prevail, a rule system and the kind of authority used to police it would be closely dependent upon the form and style of organisation.

With the exception of the included Open group schools, several indications were given that the traditional systems of rules and authority tended to function more as ends in themselves than as means to ends. While conflicts over this problem were relatively few in either set of Traditional group schools they occurred with some regularity in the excluded Open group schools. In the former two, the traditional rules were being used in a system in which they had developed anyway; the fact that rules were used often as ends rather than as means appeared to have little dysfunctional effect on the schools' operations.[6] In the latter, there was general acknowledgment and awareness that traditional rules which had derived from a more traditional organisation of education might be inappropriate and even counterproductive in Open groups. These schools however, as already suggested, tended to be those whose entry into innovation had been prefaced by relatively little in-service training, relatively little pre-entry training for students and relatively little attention to the demands of parents as to what was happening to the school and why.

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[6] Examples of rules being used as ends rather than as means to ends were remarked upon by the researcher to two principals, the first of whom indicated some interest with the observation that he had not thought of it that way before, and the second of whom observed, with a wry chuckle, that most people gain enjoyment from making and break-rules.

Hence, the conflict could be recognised in these schools, but the fact that fundamental attitudinal changes had not taken place among staff, students or parents, meant that too little willingness, knowledge and experience was applied to handling that conflict. Several teachers who went so far as to state that they were able to conceptualise and comprehend the need for an alternative rule system to match an alternative educational structure, still found themselves reverting to traditional rules almost reflexively. Others expressed the view that old rules should be preserved just because they were 'good' rules. In short, it appeared insufficient to formulate new rules without the concomitant training experiences necessary to balance out old values and to provide a basis for compatibility with the innovation. One teacher observed: "I have said to myself many times that these children will not get me 'rattled'. On logic and sheer willpower I maintain a 'front' for a time but if I sense that they are being provocative I slip back into old habits. An hour later I could kick myself!"

3. Divisibility

Divisibility is "... the degree to which an innovation may be tried on a limited basis" (Rogers, 1962:131). Divisibility is preferred here to the term later used by Rogers & Shoemaker (1971:155) 'trialability', primarily because actual attempts at innovation are being studied and not merely the trialling of innovation as a psychological exercise.

Three aspects of divisibility were noteworthy in respect of Open Education:

3.1 The extent to which particular ideas in the innovation could be used separately from the whole cluster of ideas

For many Victorian high schools, the movement towards Open Education programs was achieved through the staging posts of general studies programs, integrated courses, topic studies and work modules. While some of these schools had no immediate intention of adopting more extreme positions educationally than could be incorporated into such limited applications, all of the schools claiming to be Open, that were eventually included in the study, had already moved into more extreme positions. In general, the schemes which appeared more likely to continue (according to staff opinion) and to provide participant satisfaction tended to be those that were more all-embracing schemes. Conversely, the schemes that were less successful tended to be those which attempted to innovate by a 'tacking on' procedure.

Taking general studies by way of example it was found that teachers tended to see themselves as having to sacrifice a single-discipline approach in favor of an integrated approach in which no formal subject boundaries were recognised. However, most of those teachers either still maintained duties as traditional teachers or had retained other elements of their former traditional roles (e.g., mediating between the student and his learning experiences, working in professional isolation from other teachers, and working within a conventional timetable). To the extent that a shift in role had occurred it was a shift from subject expert to master of none. Students in two schools reported dissatisfaction with general studies teachers because those teachers pretended knowledge in areas where they clearly had very little expertise at all.

As one student observed: "Everything we do is so shallow. Every so often I would like to learn something really deep, something really worth knowing."

In the schools where there was extensive involvement in Open Education, the fact that teachers collaborated with each other both in and out of periods of student contact meant that the strengths of a given teacher were more likely to be exploited than were the weaknesses because, as one teacher noted, "... you can cover for your colleagues' weak spots and they can cover for yours".

Amongst the innovators of single ideas there was also confusion about priorities, both academically and in terms of general behavior of students. This lack of understanding also pervaded higher echelons of the staff, especially timetable planners. One session was observed in which the general studies teacher had three exchanges in one hour with her students over matters directly related to learning. In the same period, she had 18 exchanges with individuals and groups of students whom she had instructed to work together but whom she had also instructed to work without noise. The contradictory instructions revolved around the location of her class in a room full of old-fashioned desks, situated immediately opposite a senior physics class from which a complaining teacher sent frequent messages of concern about the most trivial noise.

3.2 The extent to which the innovation could be utilised by particular sections of the organisation

The typical Victorian high school can be readily classified on a sectional basis according to age/grade groupings (e.g., Forms I to VI) and departmental structure (e.g., Humanities department, Science/

Mathematics department and Manual Arts department). If an innovation is introduced into this typical high school on some kind of sectional basis it is most likely that Forms or departments will be used as the basis of the arrangement.

If the interviews with principals and teachers in the present study can be taken as indicators, the Open groups that appeared most likely to succeed and to continue in existence were those that occurred in schools where Open Education programs encompassed all staff and students. Four of the five included Open groups qualified in this respect, the exception being the one located in a country area. None of the excluded Open group schools incorporated the whole school in Open programs.

Characteristic of the four schools mentioned was the fact that the entire management effort and professional expertise of the staff could be directed towards developing a successful innovation, the main difficulties arising from those teachers who felt dubious or recalcitrant. Rules, regulations, teaching practices and timetable organisation could all be focused in the direction of common ends. From this latter point of view, similarities could be noted between these schools and the included Traditional group schools which, in such matters as syllabus organisation, classroom organisation and control strategies, lay at the other end of the educational spectrum.

The same set of interviews indicated that the Open groups less likely to succeed and continue were those which operated side by side with Traditional groups, especially when the latter were in the majority. The one included Open group school located in the country, along with two of the excluded Open group schools, claimed that the existence of Open and Traditional groups in the one institution was a direct result of pressure from senior staff, senior students and parents to allow those students to complete their secondary schooling within the expectations and framework of the external examinations system. That is, the part of these schools that was reserved for Traditional groups and classes was the senior part whose reference point was an externally designated syllabus and an external examination system. Hence, the individuals with highest status in these schools tended not to be associated with Open groups.

A second reason for both Open and Traditional groups existing side by side was given by the principals of the remaining three excluded Open group schools; namely, that the innovation was something of an experiment, the results of which would be watched carefully before any extended use was introduced.

The two Open group schools where least success was claimed by either staff or students, were those in which just a small group of junior students had been involved in Open programs. In both cases, apparently sincere efforts were made by the principals and staffs to operate the Open groups with a substantial degree of independence from the major part of the school. However, the rules, codes of behavior and teaching practices of the Traditional groups remained dominant, and as a teacher in one of these Open groups observed, "... whenever there is a compromise necessary it is (the Open groups) that are forced to give ground".

Another area of conflict, more prevalent in the two least successful groups, concerned student attitudes towards Open Education. Small groups of students interviewed in the two schools, regardless of the section of the school in which they were housed, saw Open groups as "a soft cop", "a bludge" and "a waste of time", mainly because their orientations still centred around the values enshrined in Traditional Education. These student attitudes were particularly prevalent where the sectional basis on which the alternative program had developed was departmental. A status hierarchy of departments existed in which the Mathematics/Science departments would be accorded highest status in the eyes of both teachers and students. Yet, such departments tended to be least involved with the Open groups; and students often associated this lack of involvement with the innovation having low status. This status hierarchy also appeared to affect or be affected by the different assessment procedures adopted. In Science and Mathematics, for instance, assessments have commonly been used in determining which students would be able to pursue senior school courses that would leave the way open for entry into high status university courses such as medicine and dentistry. On the other hand, assessments in Art subjects have tended to have little status for any kind of selection purpose, whether for entry into tertiary courses or into artistic occupations, employers in the latter group tending to base their selection procedures on practical examples of skilled work and on probationary jobs.

3.3 The amount of time devoted to the innovation

The problem mentioned in the previous section appeared to be aggravated in two schools not included in the main part of the present study, but visited during validation of the test instruments. Here, divisibility was not only a matter of sectional involvement but of limited time allocation as well. The problems of timetabling were viewed as a major barrier to change of any kind. A proportion of the school would be involved in Open Education for part of the school day on two or three days of the week. Almost without exception these schools experienced behavioral problems while sessions were in progress and, in each case, abandonment of the scheme was at hand. There was little doubt that, in the regular changeover from Open to Traditional organisation, students and staff alike worked on the expectation that Traditional organisation should prevail whenever the business of education was to be taken seriously. As the Form Captain in one of these groups noted, "Those sessions are good fun but they're not 'fair dinkum'".

Again, sectional representation on a departmental basis produced the greatest difficulties. In a typical instance, the Mathematic and Science subjects were deliberately withheld from the new program because "... Maths and Science are just too important to be mucked about ...", as one deputy principal explained. Presumably subjects such as English, History, Geography and Social Studies could be 'mucked about' without any serious disruption to a child's education. This separation could be supported by the rational(ised) argument that Science subjects required laboratory facilities while English, History, Geography and Social Studies, or whatever integrated studies could be derived from them, required only general purpose areas. When questioned about the use of the timetable as a weapon in restricting Open groups to particular times of day and particular combinations of subjects, one timetable planner summed up the limited perceptions of many of his fellows in other schools:

> "Anyone who thinks that a school can be run without periods being put aside for Mathematics and Science subjects is either a fool or has never had to spend half of his vacation and half of the first term slaving over a timetable."

In Chapter 3, reference was made to the possibility that certain innovations may fail to diffuse, either in the trial stage or in the long term, if they are treated as divisible, while other innovations may be threatened if they are not treated as divisible. On balance, it can be suggested that Open Education (in its various forms and degrees), if it is to survive beyond a trial stage of four or five years, should be treated as indivisible rather than divisible. When Open groups are housed in the same organisational and management structures as are Traditional groups, participants are likely to revert to the rules, procedures and practices of the latter.

The possibility of one important confounding variable should also be raised in respect of this issue. This is the possibility of a changing environment which might render an innovation more or less divisible than it would be otherwise; in particular an environmental change based on a 'black paper' backlash in which disillusionment or reactionary ground-swell concerning new ideologies forces reversion to old rules, procedures and practices.

4. Communicability

Communicability is "... the degree to which an innovation may be diffused to others" (Rogers 1962:132). Three components of communicability were mentioned in Chapter 3 above; visibility, time lag before effect and language.

4.1 Visibility

In the present study the matter of visibility has proved somewhat vexing. On one hand, Open Education was made highly visible firstly by the kinds of activities which led to the establishment of the C.A.B. and to the occurence of the Burwood Seminar. Secondly, several schools (among them, all five of the included Open group schools) devised statements of what they were trying to achieve and the educational philosophies that lay behind their endeavors. Furthermore, by 1971 these same schools had accepted the responsibility of providing for whatever number of observers (including teachers, principals, inspectors and parents) showed sufficient keenness to find out what was happening.

On the other hand, high visibility appeared to be restricted to one level of organisational functioning; namely, that concerned with behavior control. Teachers in Open groups reported that visiting teachers from Traditional schools, having spent only a few hours or a day observing an Open group, were able to grasp little of the important educational processes that were taking place. Indeed, one of the included Open group schools considered setting a minimum time of one week for observation visits. Teachers who claimed that many important aspects of their Open Education programs were very difficult to render visible stressed firstly, that the personal relationships developed with and between students were subtly but significantly different from the relationships that pervaded Traditional schools, and secondly, that any observed short term behavior could be sensibly judged only if seen in the context of a developmental process.

On the second of these points, particular reference was made to self-control and self-discipline in students. Whereas an observer on a one day visit might be struck by an apparent lack of control and discipline on the part of students, involved teachers could point out that, three weeks previously, circumstances had been far more difficult than at present, and that three weeks hence, matters would be vastly altered again if the present rate of improvement continued. An analogy was sometimes drawn between this situation and that of an individual who sees a snapshot of an event the nature of which could only be properly understood with the help of movie film.

In short, the communicability of Open Education as an innovation is confounded to the extent that, while certain aspects are highly visible certain others are claimed to be far more subtle and less visible. A small sample of teachers from the Traditional schools, having observed Open groups at least once in the preceding 12 months were almost unanimous in stating that teachers in Open groups, while undoubtedly sincere in what they were attempting, were simply not generating many of the processes as claimed. Perhaps it was not surprising that these traditional teachers classified the more visible aspects, such as freedom of movement for students and lack of conventional timetabling arrangements, as disrupture elements because, as their Open Education counterparts claimed, they had not accounted for the less visible processes.

These problems of communicability were said (by the teachers themselves) not to arise between teachers in the included Open group schools who visited each other. No cases were found, during the present study, of teachers from the excluded Open group schools visiting other Open group schools.

4.2 Time lag before effect

The results presented in Chapter 8 provide support for the view that Open groups are unlikely to produce many of their most cherished effects in a short time span; that is, Open Education may generate certain 'sleeper' effects. For example, while student attitudes towards schools might alter noticeably in conjunction with changes in the nature of the organisation, improved academic performance and varied personality structure may not do so Indeed, it is possible that these latter effects may not be achieved to any significant degree until quite late in the student's secondary school life. Certain academic skills, thought patterns and personality structures that have been built up through a virtually infinite range of experiences spread over a 12-year period prior to entry into the Open group at secondary school level apparently do not change radically in the space of ten months. Yet it was not uncommon during the present study, for teachers from either Open or Traditional groups to express doubts when rapid changes did not occur.

Open Education appears to be a classic case in which many of the 'good' effects are somewhat removed in time, while undesirable and peripheral effects may be visible almost immediately. (See Chapter 8.)

4.3 Language

Communicability may be affected by the extent to which the innovation, its purposes and results can be couched in layman's language. In this sense, a U-shaped curve of communicability could be expected. If the innovation requires just a few concepts and words that are in everyday use to describe it, communicability should be high. Similarly, if a few new concepts and words have to be generated, communicability should be high because potential adopters must deliberately learn meanings for the new jargon. Errors in meaning and translation seem more likely to occur when the innovation and its results are described in words that have both technical and lay meanings and which tend to be fairly abstract. Anybody can claim to understand the innovation because he can understand the words; however, a common understanding may not be achieved because each 'expert' imputes his own meanings.

Open Education appears to fall into this third category; each person knows what a school is; each has his own idea on how it should be organised; each knows that his own attitudes about what the school should do for students are the right attitudes. Traditional teachers, after listening to teachers from Open groups, would often claim that they had been doing for 15 years the things that had just been described to them, with the possible exception of a few seemingly trivial details such as getting rid of the conventional syllabuses, timetables and examinations.

These misconceptions could not be easily corrected. Four teachers from Traditional groups complained that teachers in Open groups were vague in explaining what was being achieved, and that little quantifiable data were available to back up claims such as: "The students seem happier", "... they read more books". and "... the students are more worldly". As one of the Open group teachers noted, the main problem for outsiders may be that of knowing what to look for. When innovators failed to provide criteria, perhaps outsiders could not be blamed for taking recourse to their own, often inappropriate criteria.[7]

5. Complexity

Complexity is "... the degree to which an innovation is relatively difficult to understand and use" (Rogers, 1962:130).

Three aspects of complexity were raised in Chapter 3, Section 4 above; the requirement for adopters to develop new mental sets, the requirement for extensive re-training in specific skills pertinent to the innovation and the requirement for a number of consequential innovations. The first two of these aspects have already been considered in some detail (see Chapter 9). Attention in this section is focused on the third aspect.

An innovator about to embark on a program, especially a program that involves a low hardware component, is likely to experience difficulty in establishing the boundaries that distinguish between what is part of his innovation (and therefore to be worked upon) and what is external (and therefore irrelevant or outside of his control). Throughout both the included and excluded Open groups in the present study this aspect of complexity generated difficulties. Witness these comments from teachers:

> "This is not simply an exercise in educational innovation like S.R.A. It's a different kind of preparation for life."
>
> "I must say that since I have been working in the Open Education program I've become conscious that the whole community should be involved. It isn't just a question of new

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[7] See Appendix 1 for discussion of the problems of evaluation and selection of criteria.

> techniques or teaching methods; rather a question of having the school relate to the family, the business world and recreation groups."
>
> "The timetable always served as a boundary. When we dispensed with conventional timetables we became life teachers, not just school teachers. I can't see any end to it."

In short, the lack of boundary definition was characteristic of the innovation itself. A few examples of consequential innovations that were considered necessary adjuncts to Open Education programs can be cited. In the four examples given below, two general types of consequential innovation are represented. In the first place, there are adjunctive innovations that concern the legal framework within which the system of public education is conducted; secondly, there are those consequential innovations concerned with staff personnel skills, sometimes falling within the ambit of re-training programs for present staff, but occasionally requiring the employment of new and different kinds of personnel within the school environment.

The first example concerned an attempt to render the employment contract more flexible so that Open Education teachers would be able to work away from the physical boundaries of the school and outside of the usual times during which a Traditional school is usually open. One teacher in an Open group found it essential to approach both the Victorian Education Department by which he was employed and a city council to arrange his joint appointment as a teacher and recreation officer so that he might have access to conventional school facilities and general community facilities at virtually any hour of the day. This kind of requirement would entail (apart from any other consideration) a change in the nature of the employment contract and, possibly, a change in the legal definition of 'teacher'.

The second example concerned the establishment of a position, within a school, that might be termed 'liaison officer' or 'activities organiser'; a person who need not be a teacher (perhaps ought not to be a teacher) and whose time and skills would be spent in the vast amount of day-by-day organisation of activities in and out of the school. This position, it was suggested, would become necessary because of the constant pressures on timetabling procedures that result from abandonment of the conventional timetable operating in schools where demands for time and space are known, fixed and repetitive. The main problems that could be foreseen in this example in Victoria would concern the teacher registration procedures (supported by the Victorian Secondary Teachers Association) and the preparedness and legal capacity of the Teachers Tribunal (an 'independent' statutory body) to employ school staff not specifically qualified as teachers.

The third example concerned the introduction of a technological aids support system comprising, especially, components that would prove useful in individual programs and computer-assisted instruction.

The fourth example was a fund-raising program necessary for a school to finance its system of excursions on which much of the Open Education program would be based. Funds would be raised through dances and other promotional activities and be disbursed on such items as a school bus and on portable accommodation that could be set up at short notice in locations where conventional accommodation was either unavailable or inappropriate.

6. Summary

As an innovation in Victorian high schools, Open Education appeared more likely to develop and continue in those schools where relative advantages were generated from reasonably serious crisis situations that forced individuals (especially teachers) to look beyond prevailing roles and expectations. Such individuals and others (students and teachers) who had undergone some preliminary training procedures also tended to view the tenets of Open Education as compatible with their own value systems more than did other individuals. Perhaps because a quite radical break with Traditional Education is required of those who enter Open groups, Open Education appears more likely to maintain a foothold on the present educational scene if it is promoted as a complete package, not readily divisible into a host of separate ideas. Hence, communication of the main ideas and practices inherent in Open Education is likely to be improved if potential adopters spend days or even weeks trying to internalise a complete package, rather than assuming that, as experts on schools, they need only listen to cursory explanations.

Finally, Open Education appears to be quite a complex innovation, especially in the sense that its boundaries are difficult to define. Thus, a series of consequential innovations is likely to be required to support the main issue of changing the educational process.

CHAPTER 11

SUMMARY AND IMPLICATIONS

1. Defining and Identifying Open Education

In recent years a number of changes have occurred in Victorian high schools; changes which have frequently been labelled with the term Open Education. Practitioners and researchers in several countries have used this label to refer variously to progressive educational philosophy, to teaching methods, to open space architecture, to curricula not articulated by forces external to the school, and to friendly or humane organisational climates. In the present study Open Education was defined in terms of learning environments which stimulate diversity of activity and problems for students, collaborative work situations, competent decision-making by students about educational and other matters, self-reliance in collating and sorting information, and effective communication skills.

Measures of organisational climate and teacher behavior were used to sharpen this definition for the purpose of selecting Open and Traditional groups to compare and contrast. These definitional characteristics and measures were assumed to occur on continua, hence Open and Traditional groups were identified in terms of polarity around opposite ends of continua, the differences between groups being assumed as differences of degree.

The main disadvantage in using the term Open Education was that various ideas and practices had one label forced upon them when, in the view of many of their practitioners there was no single, identifiable phenomenon. One major advantage, however, was that the notion of openness could be explored at five different conceptual levels, an understanding of which may lead to increased clarity and reduced confusion about modern developments in education in a broad context.

The five conceptual levels at which Open Education could be developed were identified as the socio-political level, the level of the organisation, the level of the group, the personality level and, finally, the level of individual beliefs and attitudes in cognitive structure.

On this basis Open Education in Victoria was considered as a two-phase phenomenon, the first phase comprising the development of general studies programs and involving heavy concentration on the development of open personality and open individual cognitive structures. The second phase, while continuing to involve those same levels of openness also saw attention shifting to Open Education as a phenomenon of politico-social systems, of organisations and of groups.

2. Some Effects of Open Groups on Student Behavior and Attitudes

With these levels of openness in mind, the present study concentrated on establishing whether Open and Traditional groups differed from each other in a given school year with respect to student attitudes to high school, creative thinking, collaborative behavior and preference for certain activities related to general personality structure. It was also recognised however, that the differential effects anticipated for Open groups by comparison with Traditional groups might be influenced, distorted or mediated by the types of organisation and management systems in which they occurred, and by the very innovative characteristics of Open groups as an alternative to Traditional Education.

Open and Traditional groups were found to differ from each other in certain respects related to attitudes to high school, creative thinking and collaborative behavior patterns, but not to differ with respect to preferred activities involving change or sameness, autonomy or dependence or intellectualised activities.

Open groups were significantly more positive in their attitudes to high school towards the end of the school year than were Traditional groups, a difference explained not so much by the Open groups becoming more positive but by the Traditional groups becoming progressively more negative. Open groups were also significantly more interactive and collaborative in their work than were Traditional groups, a difference that arose early in the year, suggesting that collaborative behavior could be engendered quite readily if an appropriate organisational climate was first established.

Open groups were also significantly different from Traditional groups after six weeks with respect to performance on a creative thinking task. This difference, in which the Open groups were significantly worse than their Traditional counterparts had largely disappeared towards the end of the year. The tentative explanation was that while neither Traditional nor Open groups moved significantly beyond the level presumed to exist at the beginning of the year the Open groups experienced considerable improvement between the first and second testing sessions. Apparently, one unanticipated effect of entry into Open groups was that students suffered from an initial bout of disorientation and disorganisation that was largely overcome towards the end of the year. Whether the Open groups could be expected to continue their rapid rate of recovery on creative thinking to the point where they would outstrip Traditional groups remains an interesting question to be followed up in a longitudinal study.

The Open and Traditional groups were not significantly different from each other, nor did they change over time with respect to preference for activities involving change or sameness and autonomy or dependence, nor for intellectualised activities.

When a comparison of significantly and non-significantly different effects is made, the proposition emerges that certain aspects of cognitive structure and collaborative behavior are relatively volatile areas in which environmental influences can produce quite rapid change; whereas preference for certain activities, being related more to personality structure develop to a stable level over a long period of time and are not so volatile or readily changeable. This proposition receives some support when the breakdowns of groups into Metropolitan/Rural and Large school/Small school variables are taken into account.

The only sustained significant difference on either of these variables concerned preference for activities involving change or sameness; the Metropolitan groups displaying greater preference for activities involving change at both observation sessions. If it is assumed that the majority of students had spent the greater part of their lives in one or other environment, and it is accepted that preference for particular kinds of activities is related to stable aspects of personality structure, these differences seem to warrant subsequent investigation. All of the above effects are detailed in Chapter 8.

3. Mediating Influences of Organisation Type and Management System

The mediating influences of organisational type and management system are elaborated in Chapter 9. One limiting factor on the development of Open groups was a tendency for principals and teachers to sustain limited perceptions about the school as an organisation and, hence, to see limited scope about the extent to which its organisational characteristics might be changed in order to produce amenability to an innovation such as Open Education. The similarities in the schools in which Open and Traditional groups were housed appeared to be more numerous and significant than were the differences.

With some notable exceptions (e.g., a tendency for student freedom in certain areas of decision-making traditionally held by teachers as part of their custodial responsibilities), the schools in which Open groups were housed, were forced by internal or external pressures to maintain with students those relationships typical of service organisations.

While some adventurous developments towards organic management systems occurred in the Open group schools, legislative or regulative pressures and the limited perceptions of principals, teachers, students and parents continued to maintain forms of school administration quite similar to those of Traditional group schools. The shifts towards organisation types and management systems recognised as more amenable to the innovation of Open Education, were more visible and longer sustained among the included Open group schools than among the excluded Open group schools. A major difference between these two sets of schools that may account for this result was that staff and students in the former had undergone more intensive training and development procedures and had more effectively changed their expectations about schooling.

In short, some productive alterations in organisational type and management system were sustained in Open group schools until times of crisis when either internal or external pressures forced reversion to traditionally accepted roles.

4. Mediating Influences of Innovative Characteristics of Open Education

The generally intended effects of Open Education groups were further modified by a number of innovation characteristics. The more successful groups tended to be those which had rationalised relative advantages from a basis of reasonably severe crisis; crisis apparently being a useful catalyst in teachers' endeavors to alter their own roles and, by meetings, seminars and discussions, the expectations which others hold about those roles.

Many teachers and students in Open groups (particularly those from the excluded Open group schools) found some of the tenets of Open Education incompatible with their existing values. These points of incompatibility usually centred around control, discipline and authority. From the teaching angle, it was found that many teachers could not dissociate 'good teaching' from ability and preparedness of a teacher to superimpose modes of behavior after the fashion typically identified with Traditional Education. From the student angle, teachers from excluded Open groups, in particular, those where the time allocation and extent of Open Education programs had been quite limited, were seen as weak teachers. Furthermore, the fact that many teachers were unable to develop their own syllabuses or to change the systems of rules, rewards and punishments contributed to a state of incompatibility between the previously learned values attached to Traditional Education and those apparently required for the successful innovation and continuance of Open Education programs.

The whole question of the divisibility of Open Education for use as a number of separable ideas, or for use in only one section of a school, or on a restricted time allocation led to the conclusion that Open Education is a relatively indivisible innovation. The more the Open programs were fragmented, the fewer were their prospects for continuance and the greater were their prospects for envelopment (and eventual abandonment) within that part of the school devoted to the real and serious (i.e., Traditional) business of education. When a conflict arose between the requirements of Open groups and Traditional groups operating side by side, the general expectation was that solutions would, and should favor the demands of the Traditional groups.

In terms of communicability, Open groups suffered somewhat from a tendency for outsiders to assume, erroneously in most cases, a sufficient level of expertise to make judgments about the success of Open Education programs. Although there were many advantages to be gained from Open groups being highly visible and from their purposes being expressed in relatively straightforward language, some disadvantages in the area of communication accrued (a) from the fact that most outsiders (and, perhaps, many people quite closely involved in Open groups) did not understand that certain important effects were subject to considerable time lag, (b) from the fact that some effects could only be understood if outsiders were prepared to spend time looking at processes rather than at single events, and (c) from a tendency for teachers in Open groups to be vague in expressing some of their most cherished aims.

A final innovation characteristic that mediated the effects of Open groups was the complexity of Open Education as an innovation. In the first place, successful innovation of Open Education was closely associated with an understanding on the part of teachers that they were engaged in preparing students to cope with adolescent and adult life in a very extensive way. Secondly, successful innovation was found to be closely related to understanding of the need for, and preparedness to introduce, a series of consequential innovations without which the Open groups were likely to become rather toothless tigers.

5. Introspections About the Conceptual Framework of the Study

This study has attempted to draw together in one basic framework, Open Education, a large number of changes evident in Victorian high schools since the mid-1960's.

The central question in the minds of the public-at-large concerned the likely effects on student behavior of these changes by comparison with the effects of the Traditional Education whose substantial rejection was implied in the new movement. Therefore, attention was given to certain differential effects on behavior, of Open and Traditional groups.

At the same time, it was considered unrealistic to evaluate those effects without taking account of two mediating influences thought by the researcher to be of crucial importance. The first of these influences was the combined effect of the organisational type and management system around which Open groups were to be introduced. In this regard, it was considered that certain types of organisation (in Blau & Scott (1962) terms) and management system (in Burns & Stalker (1961) terms) would be more amenable to successful innovation of Open Education than would others. The second influence concerned the fact that Open Education was seen in Victorian high schools as an innovation; the constraining and facilitating effects of the characteristics of innovation outlined by Rogers (1962) were therefore taken into account.

While the approach taken might have minor disadvantages (e.g., mixing statistical and case study methodologies may be frowned upon in certain quarters), the advantages overall to the researcher were that the recent changes in Victorian high school education could be viewed in several different perspectives, and that a study which might otherwise have portrayed those changes as a static phenomenon was able to look much more closely at the dynamic, ongoing processes of Open Education. In one sense, this conceptual framework can be viewed as a custom-built tool for the problem on which the present study is focused. In another sense, however, it might be worth investigating as a more generalised tool for similar studies in the social sciences. Indeed, there may be value in combining methodologies and concepts in this way for other than exploratory studies. The immediate future of the social sciences (especially that which is addressed to educational problems) is likely to remain bedevilled by a multivariate world that is not easily reduced to a few simple cause-effect chains. This real world might be better understood if researchers avoid committing themselves, at whatever intellectual cost, to one methodological camp to the exclusion of others. Statistical inference and qualitative methodologies appear to make better bedfellows than enemies for each other.

APPENDIX 1

A "SOURCES OF ERROR" APPROACH TO EVALUATION IN ALTERNATIVE SCHOOLING PROGRAMS

A paper presented to the Conference on Alternative Forms of Schooling, Monash University, May, 1973.

I want to take a rather unusual line on alternative forms of schooling. The first question I ask myself is: Alternative to what? What is the presumed base, the already legitimated education to which the adjective "alternative" applies. Clearly, it has to do with what we usually refer to as the traditional school. But are the various alternatives currently under development, such as open schools, community schools, integrated day programs, interactive classes and informal programs, singular in the manner in which they are alternative? It seems to me that they are singular in so far as they constitute a reaction against both extreme regimentation of students and a view of the learning process that places the teacher constantly in a central, mediating position between the learner and his learning experiences and knowledge. I seriously doubt whether the singularity moves far beyond those (admittedly important) general points.

I am not suggesting for a moment that highly divergent alternatives are a bad thing; on the contrary, the divergence strikes me as being very healthy; would that there were more of it! However, there is a price to be paid for diversity. If attempts at alternative schooling were to move inexorably along the one track, problems of evaluation would be greatly simplified. A group of competent researchers might be asked to design and validate tests that could be used widely in alternative schooling programs. The fact that many tracks are being pursued simultaneously with varying aims in mind means that no one set of evaluating instruments will meet the circumstances in the way that one set of matriculation tests presumes to meet traditional circumstances.

Therefore, evaluation must necessarily be localised to a great extent. The teachers actually involved must accept much of the responsibility for evaluating alternative programs. A few teachers have tried to evaluate for feedback or promotional purposes, a few more have largely ignored the problem, and many have resorted to traditional evaluation procedures that seem to be a denial of what the alternative programs are all about. Both my own observations in the schools and the comments made by teachers involved during university programs, lead me to ask whether some teachers may simply be ill-equipped to ask good questions, to formulate reasonable hypotheses, to design reasonable instruments and to manipulate quantitative data.

I would not pretend to be able to produce all of the answers. At the same time, my own reading and research lead me to believe that one of the greatest threats to an innovation such as an alternative schooling program, especially in the formative stages, is the inability of users to evaluate it either in its own terms or by comparison with predecessors or substitutes. Because it seems likely that teachers will need to participate in and even organise research and evaluation into alternative schooling I would like to offer a few ideas, expressed simply, that might provide a working base.

Let us call the approach a 'Sources of Error' approach. Any research and evaluation program can be seen as comprising three main stages; the first involves framing the problem or question, the second involves making observations relevant to the question, and the third involves interpreting those observations in an endeavor to answer the question. The best research and evaluation is presumably that which involves the least amount of error throughout each of the three main stages. People not trained in research techniques or who are more frightened than enlightened by quantified data will have taken the first step towards understanding research and evaluation when they can see that the name of the game is one of minimising errors between formulating a question and producing an answer. It should be noted that minimising error is not simply the reciprocal of maximising precision; for one can be extremely precise about something that is marginal to, or is an inadequate index of the question.

The sources of error approach can be elaborated by examining the polar extremes where maximum error is induced on the one hand and minimum error is induced on the other hand.

Maximum error is likely to result when non-specific or ill-formulated questions are followed by casual observations or feelings (used as a kind of observation) from which conclusions are drawn and decisions taken. For example, we sometimes hear asked of an alternative education program: Are the children in the alternative program any better than they would have been in a traditional school? Then follows the answer: Yes, they are better; they seem happier and they are more creative. While evaluation at this level might be a useful and even necessary step towards formulating other questions it does not appear to be of immense value for anyone who wants to make educational decisions. 'Better' in which ways? What is meant by 'happier' and 'creative'? Are happiness and creativity valid and explicit aims of the program? How do we measure happiness and creativity? To what extent does any observed improvement in happiness and creativity relate directly to the program, or to chance, or to factors unaccounted for? How much improvement has to occur before a significant difference can be said to exist? How is the alternative program defined.

At this level, evaluation can be hazardous and quite misleading if it is used for purposes other than hypothesis-building and hunching.

Minimum error is more likely where questions of the kind listed above are accounted for in a systematic way. A systematic approach also allows the possibility that sources of error and even the magnitude of errors can be located and taken into account when they cannot be eliminated. Although it would be possible to discuss the elements of a systematic approach to research into and evaluation of alternative schooling in great detail, the following elements may be treated as something of a smorgasboard. The more of these elements that can be included in an evaluation scheme the fewer sources of error there will be to distort findings. One cautionary note is important, however. To use an analogy, one does not gain much by hiring a mechanical press to kill a mosquito when a fly swat would do the job as effectively. In a very real sense, the nature of the problem should determine the complexity of the research and evaluation techniques that are to be employed. Research 'overkill' is not only time-wasting; it can, itself, constitute a source of error.

1. Casual observation

Casual observation, in the form of visiting, participation, relevant reading or all of these three can provide a 'feel' for an area as a whole. The main aims are to develop perspectives of one's own and to understand the perspectives of others working in the area. In alternative education, one of the very important perspectives is the process - the train of events and developments in thinking - that led to a particular program being established. For example, casual observation followed by more structured case study techniques can reveal important differences between programs with regard to their evolution from crisis or non-crisis origins; in turn, this information may be useful both in establishing hunches and in explaining differential rates of adoption and diffusion.

Perhaps the main advantage for the teacher/evaluator of casual observation is that he may find himself better able to clarify his own aims by watching what others do, how they develop their ideas and how they justify their alternatives to traditional programs. Consequently, he may be better able to establish a list of priorities, a general list that suggests characteristics of the program that are really worthy of close evaluation as distinct from characteristics for which somewhat crude evaluation will suffice. In terms of a sources of error approach, the teacher/evaluator is working out which characteristics he can afford to evaluate with a moderate risk of being wrong in his evaluation, and which characteristics must be evaluated with a very low risk of error. For instance, it may be of little consequence to know whether standards of dress are changing as a result of the alternative program but very important to know whether levels of comprehension of mathematical concepts are changing.

2. Framing a question

The data collected in an evaluation project are usually only as good as the question which led to them. The old adage, "Ask a stupid question and you get a stupid answer" applies very well to research and evaluation. Framing a good question is really the art of pin-pointing the main variables and depends on tracing one's casual observations back through channels of possible causal relations. It seems to involve a certain amount of 'mental rehearsal'. For example, the casual observation that an alternative education environment is so noisy that students are unable to work effectively either individually or in groups even when they want to, may lead to a number of mental rehearsals as to just which characteristics are associated with which others. Is the noise associated with bad discipline? If so, should more stringent rules be invoked? Is the noise associated with poor acoustics? Are there too many groups attempting to work in too confined a space? Is the noise associated with the failure of teachers to arrange preparatory sessions in which students actually learned about the difference between small group conversation and other conversation patterns?

The last of the questions in this list is probably a good question in that, when viewed amongst the others, it is an efficient and a productive question. For a given amount of research and evaluation effort a result may be achieved in which a permanent increase in manpower requirements, or rules or building costs is avoided. If the whole of that mental rehearsal proves unproductive in the sense of not achieving a desirable result, it is still productive to the extent that it is important for teachers to know which kinds of educational experiences do not lead to very much learning.

Of course, it should also be said that the selection of one good question does not pre-empt simultaneous or subsequent pursuit of other good questions. An area like alternative education involves problems for the teacher/evaluator that are clearly multivariate. Effectively, this means that certain questions must be directed towards the ultimate taking of decisions that reflect a desired balance between characteristics.

3. Choosing a conceptual framework

A sound argument exists for asking questions or framing problems in a context that suggests the terms in which subsequent results will appear. Take the question, "Are the attitudes to school of students in an alternative program more positive than the attitudes to school of students in traditional programs?" If the atmosphere in which the question is asked is one where serious doubts have been raised as to whether teachers in the alternative program are capable of maintaining discipline and controlling student behavior, a conceptual framework involving considerations of power could be utilised. If the atmosphere is one where the cognitive development of students is being questioned, a conceptual framework involving motivation may be more appropriate.

In a sources of error approach, there appear to be two main advantages in couching questions and problems in a conceptual framework. In the first place, the teacher/evaluator can be led to the work of others who have been interested in similar questions and who may have already located a variety of interesting answers or follow-up ideas. Secondly, a conceptual framework gives a clear lead as to the type of evaluation that should be used, the nature of the data that should be collected, and the kinds of decisions that could be taken on the strength of the evaluation. In addition to these main advantages, a conceptual framework can also act as a vehicle for achieving a higher level of objectivity in evaluation, where objectivity is seen as desirable.

4. Choosing a methodology

In any evaluation procedure can be found either an explicit or implicit methodology. Error will almost certainly be reduced where methodology is explicit. This really suggests that the evaluator should delineate the kinds of observations that he will accept as evidence. A case study approach in which loosely structured interviews of students are used for data gathering will produce a different kind of evidence than will be gained from paper and pencil tests that aim to quantify variables.

Another dimension to the methodology issue is the extent to which evidence should be collected through experiment, through quasi-experiment, or through simple feedback loops built into specific educational tasks. While not exhaustive these three techniques can add enormously to the teacher/evaluator's repertoire of evidence. The Campbell & Stanley (1963) division of research designs into pre-experimental, true experimental, quasi-experimental, correlational and ex post facto designs deserves understanding, if not use, by teachers in alternative schooling environments.

5. Writing specific hypotheses

Whether or not specific hypotheses are likely to be useful and necessary depends upon the evaluation problem to be tackled. The more directly evaluation is related to specific educational tasks for individual students, the less likely it is that specific hypotheses need be formulated on every occasion. Where no specific hypothesis is formulated, a general hypothesis of the following kind is almost always implied but not stated: That student performance on a given task will improve in association with educational experience in a given environment.

The more usual hypothesis-based evaluation tends to be less directly related to built-in feedback loops and regular performance tests, and more towards behavior or performance in relation to concepts and abstractions from social reality. For example, the teacher/evaluator may want to test the hypothesis that girls in a particular alternative education environment exhibit greater social maturity than boys in that environment. In all probability, little if any time in the program will have been given over directly to the development of something called social maturity; the term is a bridging concept that may reflect such aspects of behavior as frequency and quality of decision-making, self-control, self-discipline and verbal facility when in the company of other individuals. In these circumstances, specific hypotheses play a valuable part in forcing the evaluator to operationalise the concepts he uses and to gain an understanding of the separate pieces of behavior which, taken together, comprise a concept. High probability of error is virtually assured when concepts of this order remain couched in such vague language that hypotheses, explicit or implicit, cannot be tested. Even where a historical or anthropological methodology is employed the probability of error may be reduced by operationalising concepts through specific hypotheses.

6. Defining main variables

In an experimental evaluation we would use the term independent variable.

Technically, the term should neither be used in quasi-experimental evaluation nor in what might be called a natural experiment. A program of evaluation in alternative schooling might include a main variable such as 'degree of openness and traditionalism' or 'degree of openness and closure'. In the simplest possible model, the evaluation question might be expressed thus: How does A affect B? The main variable is 'A'; it is the treatment, the event, the thing that makes a difference to something else. 'A' might be the degree of openness and traditionalism in schools generally; 'B' might be the level of verbal facility displayed by the students of an alternative school.

In most social science research, and we can safely include the evaluation of alternative schooling in this category, defining a main variable with accuracy will improve the value of the whole project. More than this, it will require the researcher to become aware of the multivariate character of the world he is trying to evaluate and to control for factors in which he is not primarily interested but which might be contributing to a given result at least as much as the main variable under examination. For example, a high level of openness in an alternative education program may not, in truth, be as important as size of school in influencing social interaction skills of students. Even in those instances where a potential main variable cannot be controlled for, mere knowledge of the existence of a substantial reservoir of error can lead the evaluator to temper the conclusions he might otherwise draw about what things cause what other things and to what extent.

7. Defining criterion variables

In the true experiment we would use the term dependent variables - the behaviors, states or factors that are influenced by the main or independent variable. One of the major problems that has arisen in the evaluation of alternative education is the apparent inappropriateness of many traditional criteria. For example, tests of arithmetical processes which have been validated and normed in lockstep educational environments where one kind of curriculum theory and organisation is used, may be of little worth in evaluating the kind of progress that an alternative school expects of its students. Of course, such tests are quite useful for showing how students in alternative schools deviate from the similar age/grade groups in traditional schools; although, even then, great care must be taken in interpreting and explaining those deviations. Value judgments in which lower scores on such tests are said to be a bad thing may simply mean that the person making the judgment treats those tests as universally legitimate even when the alternative school personnel assert that such tests are not legitimate because they are only marginally related to the educational aims of the school.

Error in evaluation of alternative programs is reduced when criterion variables are defined; the very process of defining involves recognition of aims and anticipated outcomes that might otherwise be taken for granted or even overlooked.

8. Instrumenting variables

Part of the process of observing is to make judgments - of how much, how little, how intense, how frequently and so on. In the introductory section above, the word 'overkill' was used to describe a situation in which complex evaluation procedures are used to aid in a judgment that could have been made just as effectively by inspection. Just how much the teacher/evaluator ought to engage in instrument-assisted judgments and how much in judgment by inspection depends on:

(a) the nature of the problem; and

(b) the risks involved in making wrong judgments.

In an alternative school, a question about the degree of courtesy shown to teachers by students could probably be answered by inspection; firstly because the question does not, prima facie, seem worthy of complex investigation and secondly, because an incorrect judgment may not be viewed as harboring any great educational consequence.

When a decision is taken to obtain an instrument-assisted judgment, the possibility of that judgment being erroneous can be reduced by making the test instrument valid and reliable. There are several kinds of validity and reliability, but only the central ideas are raised here. Validity is the extent to which a test measures what it is supposed to be measuring. A test of arithmetic processes may not necessarily be a valid measure of mathematical concepts, although it may be a very valid measure of how well the mechanics of arithmetical manipulation have been learned. Amongst the many factors that can contribute to invalidity in the social sciences an important one for teachers to be aware of is the practice of using a test which has been developed for a particular purpose in order to make judgments about matters which that test was not fully or even partly designed to tap.

Reliability is the extent to which a test will measure the same thing again and again and produce a consistent result. A test that is repeated can be expected to produce differences in results because of errors of chance. However, a test that is unreliable is apt to produce different results at repeated testings because it can be measuring something different each time.

9. Collecting data

Data collection can be hazardous in any research and evaluation program, and the potential sources of error can be numerous. In evaluating behavior/performance in alternative schooling environments the main potential source of error concerns the conditions pertaining prior to and at the time of evaluation. For example, the collection of data on social interaction at a time when individual work has been organised for students would render any observations generally invalid unless that individual work occurred so frequently as to be the most usual form of work organisation. If a variety of work organisation techniques is employed, data collection ought perhaps to be based on sampling across the range of techniques.

For the teacher/evaluator an additional source of error may arise from evaluator bias. Participant-researchers face the temptation, probably more than other researchers, of collecting data in the manner most likely to produce a desired result. This kind of data collection problem has wide-ranging implications. It can bring avoidable error into otherwise valid and reliable instruments; it can lead to the covert testing of hypotheses other than those specified; and it can produce severe replication problems. In general, this kind of data collection error involves the teacher/evaluator concealing (even from himself) the fact that he wants to use the results of his evaluation for polemical rather than diagnostic purposes.

Data collection errors are, of course, at least as likely to occur with qualitative data as they are with quantified data.

10. Classifying data

Hypothesis-based evaluation usually requires that data be classified into categories of some description. Relatively little of the evaluation done by teachers in respect of alternative schooling will generate errors in classification, but a brief statement may be worthwhile. A sensible research rule to follow is this: However much data are manipulated they should be allowed to retain integrity. Putting the point subjectively, we might say that data should be categorised where eminent good sense would suggest they be categorised unless one is 'playing' inventively with categories. Error in the form of distortion is induced when, for example, data which have a clearly bi-modal distribution are forced into three or four categories.

Other sources of error arise from rounding and from conversion. Rounding usually involves re-stating real numbers as integers, a practice which is particulary dubious where there is a high proportion of marginal decimals in the data. For example, 5.49 is rounded to 5.00, but 5.50 is rounded to 6.00. Conversion is the practice of changing a raw score into a different form. For example, raw scores may be ranked in order of decreasing or increasing magnitude. While this procedure may be useful as an evaluation strategy, some loss of integrity in the data is inevitable if ranks are used rather than raw scores.

11. Statistical inference

The observations that the teacher/evaluator wishes to use in making decisions can be seen as samples taken from a universe of possible observations. These sample observations, that comprise the real stuff of evaluation, are an estimate of the 'true' state of affairs that exists in a population of possible observations. But the fact that they make up only one possible sample means that a somewhat erroneous picture of the 'truth' may be given.

In order to maintain reasonable knowledge of, and control over this kind of error, the researcher has a variety of statistics at his disposal from which he may infer the 'truth' on the basis of his sample data. Teachers engaged in evaluating alternative schooling programs are probably well advised to consult one or more texts on elementary statistical methods; a detailed discussion of inferential statistics is beyond the scope of this paper. However, as teachers may find it necessary to express the results that emanate from evaluation in terms of the probability that such results are 'true' results, two major sources of statistical error should be mentioned here. These are known as Type I and Type II errors.

A Type I error is committed where we test an hypothesis and reject it as false, when it is, in fact, true. A Type II error is committed where we test an hypothesis and accept it (or do not reject it) when it is, in fact, false.

12. Interpreting results and making decisions

Given the results of an evaluation program, we are faced with the problems of interpreting them in terms of the question which we originally set for ourselves. Whether the evaluation was carried out for diagnostic or selection purposes or for plain curiosity a rather frightening range of potential error sources confronts the researcher. Presumably, the worst single error to make in the evaluation of educational programs, is to interpret wrongly and then make a wrong decision on the strength of that interpretation. It has been suggested already that this is most likely to occur when a poor quality question was asked in the first place.

... ...

Now we must ask ourselves about the extent to which developments in alternative schooling are being threatened in their infancy by poor quality decisions based on error-prone evaluation techniques. My own feeling is that the time has arrived for us to take alternative education out of the hands of Lady Luck.

A post script

Having listened to the discussions of papers delivered at this Conference, I would like to reiterate one aspect of my own paper. I have tried to argue a case in favor of teachers generally upgrading their research and evaluation skills but particularly so if they are to become engaged in innovative programs. Furthermore, I have tried to outline a framework within which such a case can be made sensible.

The whole point of this exercise is to say that alternatives to traditional programs are more likely to be left without undue external interference, in the hands of their developers if those developers are capable of showing what is being achieved. Incorporated in this point is the view that the developers are less likely to undertake or abandon programs on the basis of what a marginally relevant research and evaluation report says, if they are capable of reading, evaluating and even producing research in their own right.

At the moment, there appears to be prevalent an almost irrational fear, in the minds of some teachers engaged in innovative programs, of any kind of evaluation and research. Are teachers, therefore, to be left accountable only to their own 'gut feelings'? Or are they accountable to the students and parents who want to know what educational and social value lies inherent in an innovative program? If teachers engaged in alternative programs remain accountable only to their own 'gut feelings', are they not placing themselves in as ethically indefensible a position as the teacher in a traditional program who judges his success as an educator by the number of students who exceed 49½ per cent on an examination paper.

It is precisely for the protection of divergent thinking and divergent programs, and not for their containment or constraint, that we as teachers need to be competent at saying what we want to do, why we want to do it, and how well our aims are succeeding.

APPENDIX 2

ORGANISATIONAL STRINGENCY INDEX

The purpose of the statements on the other sheets is to find your opinion about the way this group operates.

You should give answers to these statements as quickly and as accurately as you can.

There are no 'right' or 'wrong' answers. This is not a test or exam. We simply want your opinion. The teachers will not see your answers.

Directions

1. Fill in the Details section of the Answer Sheet.
2. Now answer the statements by drawing a circle around the correct symbol.

   Draw a circle around

   SA if you STRONGLY AGREE

   A if you AGREE

   D if you DISAGREE

   SD if you STRONGLY DISAGREE

   N if you cannot give an answer.

Practice Statement

0. This class is like a prison. SA A D SD N

PLEASE BE SURE TO GIVE AN ANSWER TO EVERY STATEMENT.

Details

Name: .... Boy or Girl: ....

School: .... Form: ....

1. You need to do a lot of homework if you want to get on here. SA A D SD N
2. Once you've made a mistake it's hard to live it down in this class. SA A D SD N
3. The teachers plan for us to do interesting things together outside of school time. SA A D SD N
4. The teachers spend a lot of time just making us obey rules. SA A D SD N
5. The teachers make sure we speak respectfully to them. SA A D SD N
6. People around here can really say what they think. SA A D SD N
7. People here do things on the spur of the moment. SA A D SD N
8. People here have to be careful about the way they dress. SA A D SD N
9. The teachers are broad-minded. SA A D SD N
10. Attendance is checked carefully. SA A D SD N
11. They prefer you to dress for comfort and not just appearance. SA A D SD N
12. The teachers allow discussion about sex. SA A D SD N
13. There is a strong school spirit in this class. SA A D SD N
14. We like talking about the problems in a subject just for the fun of it. SA A D SD N
15. Students like to get criticism and advice from teachers. SA A D SD N

16. New ideas are always being tried out here. SA A D SD N

17. They spend more time planning and organising than actually getting things done. SA A D SD N

18. People here speak openly and freely. SA A D SD N

19. Teachers get annoyed when students disagree with them in class. SA A D SD N

20. If you are ill they expect you to forget work and take it easy. SA A D SD N

21. We often do things in a new way. SA A D SD N

22. Everyone is expected to look and act 'right'. SA A D SD N

23. People here are reasonable about school rules; they take it easy. SA A D SD N

24. Rules are very important around here. SA A D SD N

25. Most of our teachers are strict. SA A D SD N

26. They try to make sure you don't get away with anything around here. SA A D SD N

27. There is a lot of 'red tape' in this place. SA A D SD N

28. While you're here they try to keep you under close control. SA A D SD N

29. No-one takes work too seriously here. SA A D SD N

30. There is a lot of freedom to do things in your own way. SA A D SD N

APPENDIX 3

THE 'THINGS TEACHERS SAY' TEST

Who are the four teachers who are most important for your class?

Write down their names and the subjects or areas for which they take you:

1. .... Subjects ....

2. .... Subjects ....

3. .... Subjects ....

4. .... Subjects ....

Now look at the page called 'Things Teachers Say'. Statements A, B, C and D were made by teachers.

We want to know whether you agree or disagree that the teachers whom you named would say those sorts of things.

The teachers will not see your answers.

Directions

1. Fill in the Details section of the Answer Sheet.

2. Fill in the names of your four teachers in the spaces on the Answer Sheet.

3. Look at Statement A and work out whether you agree that it sounds like the first teacher on the Answer Sheet.

4. Draw a circle around

   SA if you STRONGLY AGREE that it sounds like that teacher

   A if you AGREE that it sounds like that teacher

   D if you DISAGREE that it sounds like that teacher

   SD if you STRONGLY DISAGREE that it sounds like that teacher

   N if you cannot say at all.

5. Now work out the best answers for the other three statements and circle them.

6. Then fill in the best answers about the other teachers.

Practice Statement

Teacher 1: Mr. Listen-Quietly ....

Statement A SA A D SD N

If you strongly agree that Statement A sounds like Mr. Listen-Quietly you would circle SA on the Answer Sheet.

PLEASE BE SURE TO GIVE AN ANSWER FOR EACH ITEM.

Statement A

You will never learn anything if you do not sit quietly and listen to me.

Statement B

I am more interested in you taking a while to understand your work than I am in making you hand it in on time.

Statement C

You can ask me to work with you on this topic or you can even work out the answers with other children in the class.

Statement D

If you do not pay attention you cannot expect to pass the examinations.

Details

Name: .... Boy or Girl: ....

School: .... Form: ....

Teacher 1: ....

Statement A SA A D SD N

Statement B SA A D SD N

Statement C SA A D SD N

Statement D SA A D SD N

Teacher 2: ....

Statement A SA A D SD N

Statement B SA A D SD N

Statement C SA A D SD N

Statement D SA A D SD N

Teacher 3: ....

Statement A SA A D SD N

Statement B SA A D SD N

Statement C SA A D SD N

Statement D SA A D SD N

Teacher 4: ....

Statement A SA A D SD N

Statement B SA A D SD N

Statement C SA A D SD N

Statement D SA A D SD N

APPENDIX 4

SCALE OF STUDENT ATTITUDES TO HIGH SCHOOL

The purpose of the statements on the other sheet is to find out your opinion on certain matters.

You should give answers to these statements as quickly and as accurately as you can.

There are no 'right' or 'wrong' answers. This is not a test or exam. We simply want your opinion. The teachers will not see your answers.

Directions

1. Fill in the Details section of the Answer Sheet.
2. Now answer the statements by drawing a circle around the correct symbol.

Draw a circle around

SA if you STRONGLY AGREE
A if you AGREE
D if you DISAGREE
SD if you STRONGLY DISAGREE
N if you cannot give an answer.

Practice Statement

0. The students could run this school if they were allowed. SA A D SD N

PLEASE BE SURE TO GIVE AN ANSWER TO EVERY STATEMENT.

Details

Name: .... Boy or Girl: ....

School: .... Form: ....

1. I go to school only because I have to. SA A D SD N
2. Classrooms are dull places. SA A D SD N
3. I generally like my schoolwork. SA A D SD N
4. I like most school subjects. SA A D SD N
5. I think time spent studying is wasted. SA A D SD N
6. I enjoy going to school. SA A D SD N
7. Students should study only those subjects which they like. SA A D SD N
8. I want to leave school as soon as possible. SA A D SD N
9. I think there are better things than going to school. SA A D SD N
10. There isn't any fun in studying. SA A D SD N
11. I think my education will be of use to me after I leave school. SA A D SD N
12. Studying interferes with some of my other plans and activities. SA A D SD N
13. Teachers expect too much of the students. SA A D SD N
14. I am bored most of the time in school. SA A D SD N
15. Students should study only subjects that they feel they will need after leaving school. SA A D SD N
16. I would not do much work if I did not have to pass exams. SA A D SD N
17. Subjects like art and music are a waste of time. SA A D SD N

18. I find school interesting and challenging. SA A D SD N

19. It is enough that we should be taught to read, write and do sums. SA A D SD N

20. Teachers spend most of their time helping brainy students. SA SD N

21. I want to get as much additional education as possible. SA A D SD N

22. The most enjoyable part of my life is the time I spend in school. SA A D SD N

APPENDIX 5

CREATIVE THINKING

THE CONSEQUENCES TASK

1. Fill in the Details section.

Details

Name: .... Boy or Girl: ....

School: .... Form: ....

2. Below are three questions. Question 1 is on this side and Questions 2 and 3 are on the back.
3. Think of as many different answers as you can for each question.
4. Write your answers in the spaces under the questions.
5. You have five minutes to complete all answers.

Questions

1. What would happen if man could become invisible whenever he wanted to?

----

2. What would happen if a hole could be bored through the earth?

3. What would happen if the language of birds and animals could be understood by man?

APPENDIX 6

COLLABORATIVE BEHAVIOR PROFILE

The dimensions below are construed as nine-point scales.

Please rate the class in question based on the small-group discussion.

Circle the best scale point.

School: ....

Class: ....

1.	The students very much disliked that session of school.	0 1 2 3 4 5 6 7 8	The students very much enjoyed that session of school.
2.	The students were not involved with the legitimate activities of the session.	0 1 2 3 4 5 6 7 8	The students were very much involved in the legitimate activities of the session.
3.	Communication between students was disapproved or rigorously controlled.	0 1 2 3 4 5 6 7 8	Teacher(s) approved of communication that operated without immediate teacher control.
4.	Communication between students was 'work-negative'.	0 1 2 3 4 5 6 7 8	Communication between students was 'work-positive'.
5.	Students did not use the teacher(s) as a resource (active teacher dominates student access to issues).	0 1 2 3 4 5 6 7 8	Students used the teacher(s) as a resource (active student takes issued to passive but available teacher).
6.	Students were not encouraged to research and discover (sheer transmission of particular information was of primary importance).	0 1 2 3 4 5 6 7 8	Students were encouraged to research and discover for themselves (particular information was secondary to research activity).

APPENDIX 7

PREFERRED ACTIVITIES INDEX

The purpose of the statements on the other sheet is to find out your opinion on certain matters.

You should give answers to these statements as quickly and as accurately as you can.

There are no 'right' or 'wrong' answers. This is not a test or exam. We simply want your opinion. The teachers will not see your answers.

Directions

1. Fill in the Details section of the Answer Sheet.
2. Now answer the statements by drawing a circle around the correct symbol.

   Draw a circle around

   SA if you STRONGLY AGREE

   A if you AGREE

   D if you DISAGREE

   SD if you STRONGLY DISAGREE

   N if you cannot give an answer.

Practice Statement

0. I like League football. SA A D SD N

PLEASE BE SURE TO GIVE AN ANSWER TO EVERY STATEMENT.

Details

Name: .... Boy or Girl: ....

School: .... Form: .... Age: ....

1. I like listening to an expert explain his ideas. SA A D SD N

2. I like changing my interests. SA A D SD N

3. I like working out new ways to answer questions in tests of schoolwork. SA A D SD N

4. I like being an independent person. SA A D SD N

5. I like teachers who tell me how to do things. SA A D SD N

6. I like doing things at regular times. SA A D SD N

7. I like thinking about difficult problems. SA A D SD N

8. I like talking about my problems with the family. SA A D SD N

9. I like to be looked after. SA A D SD N

10. I like to make sure I don't change too much as a person. SA A D SD N

11. I like listening to other people before I make a decision. SA A D SD N

12. I like working out an answer even though I don't know how to apply it. SA A D SD N

13. I like solving puzzles. SA A D SD N

14. I like doing things a different way every time. SA A D SD N

15. I like working out why everything happens. SA A D SD N

16. I like talking about things without having to think too hard. SA A D SD N

17. I like staying in the same circle of friends all of the time. SA A D SD N

18. I like being told what to do. SA A D SD N

19. I like being left alone to work out my personal problems. SA A D SD N

20. I like just sitting and thinking. SA A D SD N

21. I like having someone around who can help when I'm in trouble. SA A D SD N

22. I like keeping my worries to my self. SA A D SD N

23. I like being the same as I am. SA A D SD N

24. I like the idea of moving to new places to live. SA A D SD N

25. I like being a real thinker. SA A D SD N

26. I like changing my opinions. SA A D SD N

27. I like asking a lot of questions. SA A D SD N

28. I like working on a problem at school even though I know the teacher won't put a question about it on the exam. SA A D SD N

29. I like eating the same kinds of foods because I know what to expect. SA A D SD N

30. I like having other people decide whether I should do something. SA A D SD N

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